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# SEARCH REQUEST FORM

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Art Unit: 1623 Phone Number 308-1620 Serial Number: 10/088419  
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Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

*see attached sub/assignment sheets*

Earliest Priority Filing Date: 9-13-00

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

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Please search the freeze-thaw  
stable starch of attached  
claims 1-8, 12-21, 26-35,  
40-42, 44-47, 49-52, 71, 74, 75,  
and 80.

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FILE LAST UPDATED: 24 Apr 2003 (20030424/ED)

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L49 ANSWER 1 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:366822 HCAPLUS

DN 137:62426

TI The influence of **starch** swelling on the material properties of cooked **potatoes**

AU Ormerod, A.; Ralfs, J.; Jobling, S.; Gidley, M.

CS Unilever R and D Colworth, Sharnbrook, MK44 1LQ, UK

SO Journal of Materials Science (2002), 37(8), 1667-1673

CODEN: JMTSAS; ISSN: 0022-2461

PB Kluwer Academic Publishers

DT Journal

LA English

CC 17-10 (Food and Feed Chemistry)

AB Cooked **potatoes** have a wide range of food applications, but the mechanism by which softening occurs on **heating** is not clearly understood. **Heating potato** parenchyma tissue results in two independent, concurrent events; weakening of the binding between cells and swelling of intra-cellular **starch**. **Potato** plants contg. **starches** with a range of high **amylose** contents and reduced swelling properties were available. This provided the opportunity to sep. cooking effects of inter-cellular pectin from swelling of intra-cellular **starch**. Their individual contribution to the sepn. of cells and the softening of cooked **potato** tissue was established by studying the influence of **heat** on the material properties of a range of **starch**-modified **potatoes**. For all **potato** lines studied, the strength of the **heated** tissue decreased markedly following 30 min at 80.degree. or 5 min at 100.degree.. Microscopy of the line in which there was minimal **starch** swelling, indicated that the cells of the cooked tissue principally contained fluid, in contrast to the controls in which the cells were filled with swollen **starch** on cooking. Since all the lines followed the same trend with regard to the **thermal** weakening of the tissue, weakening of **potato** tissue on cooking is primarily controlled by **thermal** degrdn. of the middle lamella.

ST **potato** cooking **starch** swelling cell wall

IT Cooking

(boiling; **starch** swelling effect on material properties of cooked **potatoes**)

IT Cell wall  
(middle lamella; **starch** swelling effect on material properties of cooked **potatoes**)

IT Food swelling  
Food texture  
**Potato (Solanum tuberosum)**  
(**starch** swelling effect on material properties of cooked **potatoes**)

IT 9005-25-8, **Starch**, biological studies 9005-82-7, **Amylose**  
RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); BIOL (Biological study); PROC (Process)  
(**starch** swelling effect on material properties of cooked **potatoes**)

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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- (2) Binner, S; J Sci Food Agric 2000, V80, P216 HCAPLUS
- (3) Carpita, N; The Plant Journal 1993, V3, P1 HCAPLUS
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- (5) Edwards, A; The Plant Journal 1999, V17, P251 HCAPLUS
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- (7) Gidley, M; EP 0850570 1998
- (8) Greve, L; J Agric Food Chem 1994, V42, P2896 HCAPLUS
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- (15) Safford, R; Carbohydr Polym 1998, V35, P155 HCAPLUS
- (16) Sajjaanantakul, T; J Food Sci 1989, V54, P1272 HCAPLUS
- (17) Schwall, G; Nature Biotechnology 2000, V18, P551 HCAPLUS
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- (19) Waldron, K; Trends in Food Sci & Technol 1997, V8, P213 HCAPLUS
- (20) Warren, D; J Sci Food Agric 1974, V25, P129

L49 ANSWER 2 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
AN 2002:181102 HCAPLUS  
DN 136:385090  
TI Production of a **freeze-thaw-stable potato starch** by antisense inhibition of 3 **starch** synthase genes

AU **Jobling, Stephen A.; Westcott, Roger J.; Tayal, Akash; Jeffcoat, Roger; Schwall, Gerhard P.**

CS Colworth House, Unilever Research, Bedford, MK44 1LQ, UK  
SO Nature Biotechnology (2002), 20(3), 295-299  
CODEN: NABIF9; ISSN: 1087-0156  
PB Nature America Inc.  
DT Journal; General Review  
LA English  
CC 17-0 (Food and Feed Chemistry)  
AB A review. The use of unmodified **starches** in frozen foods is severely limited by the undesirable textural changes that occur after **freezing** and **thawing**. Retrogradation of **glucan** chains leads to syneresis, a sepn. of the **starch** gel and water phases. Stabilization of **glucan** chains leads to syneresis, a sepn. of the **starch** gel and water phases. Stabilization of the **starch** structure is normally achieved by chem. modification to prevent these changes from occurring. We have now

created a **freeze-thaw-stable potato starch** by alteration of **starch** compn. and structure by genetic modification. An **amylose-free starch** with short-chain **amylopectin** was produced by simultaneous antisense downregulation of 3 **starch** synthase genes. This **starch** is extremely **freeze-thaw** stable and shows no syneresis even after 5 **freeze-thaw** cycles. The use of this **starch** has potential for environmental and consumer benefits because its prodn. requires no chem. modification.

- ST review **potato** antisense **starch** synthase gene  
**freeze thaw** stable
- IT Gene, plant  
RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(GBSS; prodn. of a **freeze-thaw-stable potato amylose-free starch** by antisense inhibition of 3 **starch** synthase genes)
- IT **Potato (Solanum tuberosum)**  
(prodn. of a **freeze-thaw-stable potato amylose-free starch** by antisense inhibition of 3 **starch** synthase genes)
- IT Antisense DNA  
RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(prodn. of a **freeze-thaw-stable potato amylose-free starch** by antisense inhibition of 3 **starch** synthase genes)
- IT 9030-10-8, **Starch** synthase  
RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(**freeze-thaw-stable potato amylose-free starch** with short-chain **amylopectin** by antisense inhibition of 3 **starch** synthase genes)
- IT 9005-25-8, **Starch**, biological studies  
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)  
(**freeze-thaw-stable potato amylose-free starch** with short-chain **amylopectin** by antisense inhibition of 3 **starch** synthase genes)
- IT 9005-82-7, **Amylose** 9037-22-3, **Amylopectin**  
RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(prodn. of a **freeze-thaw-stable potato amylose-free starch** by antisense inhibition of 3 **starch** synthase genes)

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L49 ANSWER 3 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:412261 HCAPLUS

DN 135:256415

TI **Thermal** transition characteristics and gel properties of **heat-moisture** treated corn and **potato starches**

AU Chung, Hyun-Jung; Chang, Eun-Hee; Lim, Seung-Taik

CS Graduate School of Biotechnology, Korea Univ., Seoul, 136-701, S. Korea

SO Zywnosc (2000), 7(2, Supl.), 37-48

CODEN: ZYWNFL

PB Polskie Towarzystwo Technologow Zywnosci, Oddzial Malopolski

DT Journal

LA English

CC 17-11 (Food and Feed Chemistry)

AB Normal corn **starch** contg. 25 or 30% moisture and **potato starch** contg. 20 or 25% moisture were **heat-moisture** treated at 1200C for 1 h and the changes in **thermal** transition characteristics and gel properties of the **starches** were examd. Granular crystallinity on X-ray diffractograms, esp. for **potato starch**, was reduced by the **heat-moisture** treatment (HMT). At a limited moisture content (15% based on total wt.), Tg measured in granular form of **starch** decreased by 2-6.degree.C. At Tg, the change in **heat** capacity (.DELTA.Cp) of the treated **starch** was substantially higher than of the corresponding native **starch**. Crystal melting of the **heat-moisture** treated **starches**, measured at 80% moisture, appeared to be biphasic on a DSC thermogram, in that the original endotherm became smaller while a new endotherm at higher **temp.** was enlarged by the HMT. However, the total melting enthalpy for **starch** decreased, indicating a partial loss of crystallinity. The degree of retrogradation under DSC was not significantly different between the native and treated **starches**. The HMT **starches** formed the gel with more opaqueness and brittleness. The gel stability from **freeze-thawing** treatment was slightly increased with corn **starch**, but decreased with **potato** by the HMT. Overall results on the paste viscosity and gel properties indicated that the HMT provided phys. crosslinking effects on **starch**.

ST **thermal** transition **heat** moisture treated **starch** gel

IT **Temperature** effects, biological  
(**heat**; **thermal** transition and gel properties of **heat-moisture** treated corn and **potato starches**)

IT Corn  
Crystallinity  
Differential scanning calorimetry  
Food gels  
Fusion enthalpy  
Phase transition

**Potato (Solanum tuberosum)**

(**thermal** transition and gel properties of **heat** -moisture treated corn and **potato starches**)

IT 7732-18-5, water, biological studies 9005-25-8, **starch**, biological studies

RL: FFD (Food or feed use); PRP (**Properties**); BIOL (Biological study); USES (Uses)

(**thermal** transition and gel properties of **heat** -moisture treated corn and **potato starches**)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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L49 ANSWER 4 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:208404 HCAPLUS

DN 134:249650

TI Transgenic **potatoes** with altered activity in two or more  
**starch**-modifying enzymes and **starch** with modified  
properties

IN **Jobling, Stephen Alan; Schwall, Gerhard Peter;**  
**Westcott, Roger John**

PA National Starch and Chemical Investment Holding Corporation, USA

SO PCT Int. Appl., 77 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C12N015-00

CC 11-1 (Plant Biochemistry)

Section cross-reference(s): 3, 7, 17

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001019975	A2	20010322	WO 2000-GB3522	20000913 <--
	WO 2001019975	A3	20010927		
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	EP 1212440	A2	20020612	EP 2000-958901	20000913 <--
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL			
	JP 2003509047	T2	20030311	JP 2001-523747	20000913 <--
PRAI	GB 1999-21830	A	19990915 <--		
	WO 2000-GB3522	W	20000913 <--		

AB Disclosed is **potato starch** which, when in native form  
extd. from a **potato** plant, exhibits **freeze/**  
**thaw** stability such that a 1 %w/v aq. suspension of the  
**starch** has an absorbance at 700nm wavelength of less than 1.2  
units following 4 **freeze/thaw** cycles of  
**freezing** at -70 >C overnight and **thawing** at room  
**temp.** for at least 2 h; together with a method of altering the  
**starch** content of a plant; and altered plants, esp. altered plants  
which contain **freeze/thaw** stable **starch**.

Further disclosed is waxy (i.e. low **amylose**) **starch** having reduced gelatinization onset and swelling **temps.** The **starch** is synthesized in transgenic **potatoes** with altered levels of three isoenzymes of **starch** synthase (granule-bound **starch** synthase I (GBSSI), and isoenzymes II and III). This can be achieved by lowering the levels of the enzymes using antisense DNA to block gene expression. Plants lacking all three activities were constructed by serial transformation with antisense DNAs for all three genes. **Amylose** content was most sensitive to levels of GBSSI. **Starch** granule **amylose** content was lowered to 3-11% and the granules had an altered, cracked, morphol. These **starches** showed lowered initial swelling **temps.** and lower final viscosities.

- ST **starch** compn gelatinization retrogradation **potato**;  
synthase **starch** isoenzyme level **potato** retrogradation  
gelatinization
- IT Gene, plant  
RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP  
(Properties); BIOL (Biological study); USES (Uses)  
(amf, for granule-bound **starch** synthase I of **potato**  
; transgenic **potatoes** with altered activity in two or more  
**starch**-modifying enzymes and **starch** with modified  
properties)
- IT DNA sequences  
(for **starch** synthase of **potato**; transgenic  
**potatoes** with altered activity in two or more **starch**  
-modifying enzymes and **starch** with modified properties)
- IT Recrystallization  
(**freeze-thaw** induced, **starch** resistance  
to; transgenic **potatoes** with altered activity in two or more  
**starch**-modifying enzymes and **starch** with modified  
properties)
- IT Antisense DNA  
RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
(in inhibition of **starch** synthase gene expression; transgenic  
**potatoes** with altered activity in two or more **starch**  
-modifying enzymes and **starch** with modified properties)
- IT Breeding, plant  
(of **potato** for altered **starch** properties;  
transgenic **potatoes** with altered activity in two or more  
**starch**-modifying enzymes and **starch** with modified  
properties)
- IT Genetic engineering  
(of **potato starch** properties; transgenic  
**potatoes** with altered activity in two or more **starch**  
-modifying enzymes and **starch** with modified properties)
- IT Protein sequences  
(of **starch** synthase of **potato**; transgenic  
**potatoes** with altered activity in two or more **starch**  
-modifying enzymes and **starch** with modified properties)
- IT Food gelling  
(**starch** with altered gelling behavior; transgenic  
**potatoes** with altered activity in two or more **starch**  
-modifying enzymes and **starch** with modified properties)
- IT **Potato (Solanum tuberosum)**  
(transgenic **potatoes** with altered activity in two or more  
**starch**-modifying enzymes and **starch** with modified  
properties)
- IT Plant cell  
(transgenic; transgenic **potatoes** with altered activity in two  
or more **starch**-modifying enzymes and **starch** with  
modified properties)
- IT 9030-10-8, **Starch** synthase

RL: AGR (Agricultural use); BPR (Biological process); BSU (Biological study, unclassified); CAT (Catalyst use); BIOL (Biological study); PROC (Process); USES (Uses)

(altering relative levels of isoenzymes of; transgenic **potatoes** with altered activity in two or more **starch**-modifying enzymes and **starch** with modified properties)

IT 9012-72-0, **Glucan**

RL: AGR (Agricultural use); BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence); USES (Uses)

(altering relative levels of long and short forms in **starch**; transgenic **potatoes** with altered activity in two or more **starch**-modifying enzymes and **starch** with modified properties)

IT 9005-82-7, **Amylose** 9037-22-3, **Amylopectin**

RL: BOC (Biological occurrence); BSU (Biological study, unclassified); FFD (Food or feed use); MFM (Metabolic formation); PRP (Properties); BIOL (Biological study); FORM (Formation, nonpreparative); OCCU (Occurrence); USES (Uses)

(altering **starch** content of; transgenic **potatoes** with altered activity in two or more **starch**-modifying enzymes and **starch** with modified properties)

IT 330869-84-6

RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)

(amino acid sequence; transgenic **potatoes** with altered activity in two or more **starch**-modifying enzymes and **starch** with modified properties)

IT 140824-92-6, GenBank X58453

RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)

(nucleotide sequence; transgenic **potatoes** with altered activity in two or more **starch**-modifying enzymes and **starch** with modified properties)

IT 9005-25-8, **Starch**, biological studies

RL: BSU (Biological study, unclassified); FFD (Food or feed use); MFM (Metabolic formation); **PRP (Properties)**; BIOL (Biological study); FORM (Formation, nonpreparative); USES (Uses)

(transgenic **potatoes** with altered activity in two or more **starch**-modifying enzymes and **starch** with modified properties)

L49 ANSWER 5 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:549377 HCAPLUS

DN 133:221771

TI Deep-freezing of potato starch

AU Szymonska, Joanna; Krok, Franciszek; Tomasik, Piotr

CS Department of Chemistry, Agriculture University, Krakow, 30-059, Pol.

SO International Journal of Biological Macromolecules (2000), 27(4), 307-314

CODEN: IJBMDR; ISSN: 0141-8130

PB Elsevier Science B.V.

DT Journal

LA English

CC 17-4 (Food and Feed Chemistry)

AB Samples of oven-dried, air-dried, and moisturized **potato starch** (5, 13, and 24% wt./wt. moisture content, resp.) were frozen in liq. nitrogen. Samples after **thawing** were studied by means of cross-polarized light beam microscope, Fourier Transformation IR Spectroscopy (FT-IR), powder x-ray diffractometer, and non-contact At. Force Microscope (nc-AFM). Rapid deep-freezing followed by **thawing** produced changes on the granule surface.



They were accompanied by internal alteration manifested by FT-IR spectra and powder x-ray diffractograms. The results depended on the water content in the sample. Deep-freezing of moistened starch resulted in increased crystallinity of granules. It had minor effect on the granule aq. soly. and characteristics of gelation.

ST deep freezing potato starch

IT Freezing

(deep-; of potato starch)

IT Crystallinity

Food functional properties

Food gelling

Food processing

Food solubility

Food viscosity

Humidity

Potato (*Solanum tuberosum*)

Water binding (food)

(deep-freezing of potato starch)

IT Organelle

(granule; deep-freezing of potato starch)

IT 9005-25-8, Starch, properties

RL: PRP (Properties)

(deep-freezing of potato starch)

RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD

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- L49 ANSWER 6 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2000:347082 HCAPLUS  
 DN 133:86722  
 TI Production of very-high-amylose potato starch  
 by inhibition of SBE A and B  
 AU Schwall, Gerhard P.; Safford, Richard; Westcott, Roger  
 J.; Jeffcoat, Roger; Tayal, Akash; Shi, Yong-Cheng; Gidley, Michael  
 J.; Jobling, Stephen A.  
 CS Unilever Research Colworth, Sharnbrook, Bedford, MK44 1LQ, UK  
 SO Nature Biotechnology (2000), 18(5), 551-554  
 CODEN: NABIF9; ISSN: 1087-0156  
 PB Nature America Inc.  
 DT Journal  
 LA English  
 CC 11-1 (Plant Biochemistry)  
 Section cross-reference(s): 17, 44  
 AB High-amylose starch is in great demand by the  
 starch industry for its unique functional properties. However,  
 very few high-amylose crop varieties are com. available. The  
 generation of very-high-amylose potato starch  
 was obtained by genetic modification. This was achieved by simultaneously  
 inhibiting two isoforms of starch branching enzyme to below 1%  
 of the wild-type activities. Starch granule morphol. and compn.  
 were noticeably altered. Normal, high-mol.-wt. amylopectin was  
 absent, whereas the amylose content was increased to levels  
 comparable to the highest com. available maize starches. In  
 addn., the phosphorus content of the starch was increased more  
 than fivefold. This unique starch, with its high  
 amylose, low amylopectin, and high phosphorus levels,  
 offers novel properties for food and industrial applications.
- ST amylose starch potato branching enzyme;  
 genetic transformation potato amylose starch  
 IT Potato (Solanum tuberosum)  
 Transformation, genetic  
 (prodn. of very-high-amylose potato starch  
 by inhibition of starch-branching enzyme A and B)  
 IT 7723-14-0, Phosphorus, biological studies 9001-97-2,  
 Starch branching enzyme 9005-25-8, Starch,  
 biological studies 9005-82-7, Amylose 9037-22-3,  
 Amylopectin  
 RL: BOC (Biological occurrence); BSU (Biological study, unclassified);  
 BIOL (Biological study); OCCU (Occurrence)  
 (prodn. of very-high-amylose potato starch  
 by inhibition of starch-branching enzyme A and B)
- RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L49 ANSWER 7 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:811367 HCAPLUS

DN 132:31779

TI Improvements in or relating to plants and plant **starch** products resulting from transformation with antisense **starch** synthase constructs

IN Edwards, Elizabeth Anne; Jobling, Stephen Alan; Martin, Catherine Rosemary; Schwall, Gerhard Peter; Smith, Alison Mary; Westcott, Roger John

PA National Starch and Chemical Investment Holding Corporation, USA

SO PCT Int. Appl., 50 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C12N015-54

ICS C12N015-82; C08B030-04; A01H005-00

CC 3-2 (Biochemical Genetics)

Section cross-reference(s): 11, 17, 40, 43, 44

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9966050	A1	19991223	WO 1999-GB1902	19990615 <--
<p>W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM</p> <p>RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG</p>				
CA 2331300	AA	19991223	CA 1999-2331300	19990615 <--
AU 9943802	A1	20000105	AU 1999-43802	19990615 <--
EP 1092033	A1	20010418	EP 1999-926617	19990615 <--
<p>R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI</p>				
JP 2002518015	T2	20020625	JP 2000-554859	19990615 <--
PRAI EP 1998-304716	A	19980615 <--		
WO 1999-GB1902	W	19990615 <--		
<p>AB A method for modifying plants by manipulating the activity of a combination of plant enzymes having <b>starch</b> synthase activity, in particular <b>starch</b> synthase II (SSII) and <b>starch</b> synthase III (SSIII). Modified plants, their use as food products and <b>starch</b>, in particular obtained from a modified <b>potato</b> plant, having novel properties and uses thereof are also disclosed. <b>Starch</b> extd. from <b>potato</b> plants transformed by introduction of and SSII/SSIII combination operably linked in the antisense orientation to a suitable promoter, has a viscosity onset <b>temp.</b> as detd. by viscoamylograph, which is significantly reduced compared to the effects predicted by reducing the 2 isoforms individually or in unmodified plants. The modified <b>starch</b> may have uses in food processing and other applications, such as in the paper, textiles, and adhesives industries (no data).</p>				
<p>ST plant transformation antisense <b>starch</b> synthase; <b>potato</b> transformation antisense <b>starch</b> synthase</p>				
<p>IT Adhesives</p> <p>Barley</p> <p>Cassava (Manihot esculenta)</p> <p>Corn</p> <p>Food processing</p> <p>Paper</p>				

Pea  
 Plant (Embryophyta)  
**Potato (Solanum tuberosum)**  
 Rice (Oryza sativa)  
 Textiles  
 Tomato  
 Transformation, genetic  
 Wheat

(improvements in or relating to plants and plant **starch**  
 products resulting from transformation with antisense **starch**  
 synthase constructs)

IT Antisense DNA

RL: BUU (Biological use, unclassified); BIOL (Biological study); USES  
 (Uses)

(improvements in or relating to plants and plant **starch**  
 products resulting from transformation with antisense **starch**  
 synthase constructs)

IT Plasmid vectors

(pPOT17 and pSJ42 and pSJ119; improvements in or relating to plants and  
 plant **starch** products resulting from transformation with  
 antisense **starch** synthase constructs)

IT 9030-10-8, **Starch** synthase

RL: BPR (Biological process); BSU (Biological study, unclassified); BUU  
 (Biological use, unclassified); BIOL (Biological study); PROC (Process);  
 USES (Uses)

(II and III; improvements in or relating to plants and plant  
**starch** products resulting from transformation with antisense  
**starch** synthase constructs)

IT 9005-25-8DP, **Starch**, modified, biological studies

RL: BMF (Bioindustrial manufacture); FFD (Food or feed use); NUU  
 (Other use, unclassified); PRP (Properties); BIOL (Biological  
 study); PREP (Preparation); USES (Uses)

(improvements in or relating to plants and plant **starch**  
 products resulting from transformation with antisense **starch**  
 synthase constructs)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L49 ANSWER 8 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:636767 HCAPLUS

DN 131:335948

TI The potential of hull-less barley

AU Bhatti, R. S.

CS Crop Development Centre, Department of Plant Sciences, University of  
 Saskatchewan, Saskatoon, SK, S7N 5A8, Can.

SO Cereal Chemistry (1999), 76(5), 589-599

CODEN: CECHAF; ISSN: 0009-0352

PB American Association of Cereal Chemists

DT Journal; General Review

LA English

CC 17-0 (Food and Feed Chemistry)

AB A review with 124 refs. Hull-less barley (HB) has been investigated in

many countries for use in feed, food, and industry since the publication of the last review in 1986. Literature published since 1990 on various aspects of HB utilization, other than in monogastric feeds, has been reviewed. Several HB cultivars contg. low or high **.beta.-glucan**, low or high ext. viscosity, and waxy (0-5% **amylose**) or normal **starch** are now available. Interest in HB utilization in the food industry developed largely due to its high **.beta.-glucan** content, particularly in the waxy cultivars. **.beta.-Glucan** is a major component of sol. fiber implicated in hypocholesterolemia, hypoglycemia, and in reducing incidence of chem. induced colon cancer in exptl. animals. However, large-scale clin. trials using human subjects are needed to corroborate these effects. The zero **amylose** HB **starch** had low syneresis or a high **freeze-thaw** stability suitable for use in **frozen** foods. Single- or double-modified waxy HB **starch** may replace corn **starch** in some food applications, and cationized HB **starch** can replace corn and **potato starches** in the pulp and paper industry. HB may be milled using conventional wheat milling equipment to yield bran and flour for multiple food uses. Hull-less barley may also be used as feed stock for fuel alc. prodn., for the prepn. of food malt with low or high enzyme activities, and for brewer's and distiller's malts.

ST review hulless barley feed food industry

IT Food industry  
(feed; the potential of hulless barley)

IT Barley  
(hulless; the potential of hulless barley)

IT Food industry  
Industry  
(the potential of hulless barley)

IT 9005-25-8, **Starch**, biological studies  
RL: BOC (Biological occurrence); BSU (Biological study, unclassified);  
**PRP (Properties)**; BIOL (Biological study); OCCU (Occurrence)  
(the potential of hulless barley)

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L49 ANSWER 9 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:369240 HCAPLUS

DN 131:115640

TI Assessment of some parameters involved in the gelatinization and retrogradation of **starch**

AU Garcia-Alonso, Alejandra; Jimenez-Escrig, Antonio; Martin-Carron, Nuria; Bravo, Laura; Saura-Calixto, Fulgencio

CS Departamento de Metabolismo y Nutricion, Instituto del Frio, Consejo Superior de Investigaciones Cientificas, (CSIC), Madrid, 28040, Spain

SO Food Chemistry (1999), 66(2), 181-187

CODEN: FOCHDJ; ISSN: 0308-8146

PB Elsevier Science Ltd.

DT Journal

LA English

CC 17-11 (Food and Feed Chemistry)

AB Factors influencing the formation of resistant **starch** (RS) during gelatinization and retrogradation were studied in **starches** and flours from cereals (wheat, corn, rice) and **potato**. RS obtained using a high-pressure autoclave system varied between 3.94 and 21.21% (rice and **potato starches**, resp.) similar to the values obtained after gelatinization in a boiling water bath. Except for rice, RS was higher in pure **starches** than in flours. Stirring during gelatinization yielded more homogeneous products than non-stirred samples. Apparently, gelatinization was unaffected by pH values between 3.5 and 10.5. To obtain optimum RS yields during retrogradation, it was necessary to **cool down starch**

gels prior to **freezing**, followed by **thawing** at room temp. and drying at 60.degree.C. These conditions ensure good yields in the formation of RS with potential industrial applications.

ST **starch** resistant gelatinization retrogradation

IT Flours and Meals  
Flours and Meals  
(corn; parameters involved in gelatinization and retrogradation of **starch**)

IT Corn  
Potato (*Solanum tuberosum*)  
Potato (*Solanum tuberosum*)  
Rice (*Oryza sativa*)  
Rice (*Oryza sativa*)  
(flour; parameters involved in gelatinization and retrogradation of **starch**)

IT Corn  
(meal; parameters involved in gelatinization and retrogradation of **starch**)

IT Digestibility  
Drying  
Food gelling  
**Freezing**  
Recrystallization  
Wheat flour  
(parameters involved in gelatinization and retrogradation of **starch**)

IT Flours and Meals  
Flours and Meals  
(potato flour; parameters involved in gelatinization and retrogradation of **starch**)

IT Flours and Meals  
Flours and Meals  
(rice; parameters involved in gelatinization and retrogradation of **starch**)

IT Mixing  
(stirring; parameters involved in gelatinization and retrogradation of **starch**)

IT 9005-25-8, **Starch**, biological studies  
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); PRP (**Properties**); BIOL (Biological study); PROC (Process); USES (Uses)  
(parameters involved in gelatinization and retrogradation of **starch**)

RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L49 ANSWER 10 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:362442 HCAPLUS

DN 131:181600

TI A minor form of **starch** branching enzyme in **potato** (**Solanum tuberosum** L.) **tubers** has a major effect on **starch** structure: cloning and characterisation of multiple forms of SBE A

AU Jobling, Stephen A.; Schwall, Gerhard P.; Westcott, Roger J.; Sidebottom, Christopher M.; Debet, Martine; Gidley, Michael J.; Jeffcoat, Roger; Safford, Richard

CS Unilever Research, Bedford, MK44 1LQ, UK

SO Plant Journal (1999), 18(2), 163-171

CODEN: PLJUED; ISSN: 0960-7412

PB Blackwell Science Ltd.

DT Journal

LA English

CC 7-5 (Enzymes)

Section cross-reference(s): 3, 11

AB Full length cDNAs encoding a second **starch** branching enzyme (SBE A) isoform have been isolated from **potato tubers**. The predicted protein has a mol. mass of 101 kDa including a transit peptide of 48 amino acids. Multiple forms of the SBE A gene exist which differ mainly in the length of a polyglutamic acid repeat at the C-terminus of the protein. Expression of the mature protein in *Escherichia coli* demonstrates that the gene encodes an active SBE. Northern anal. demonstrates that SBE A mRNA is expressed at very low levels in **tubers** but is the predominant isoform in leaves. This expression pattern was confirmed by Western anal. using isoform specific polyclonal antibodies raised against *E. coli* expressed SBE A. SBE A protein is found predominantly in the sol. phase of **tuber** exts., indicating a stromal location within the plastid. Transgenic **potato** plants expressing an antisense SBE A RNA were generated in which almost complete redns. in SBE A were obsd. SBE activity in the leaves of these plants was severely reduced, but **tuber** activity was largely unaffected. Even so, the compn. and structure of **tuber starch** from these plants was greatly altered. The proportion of linear chains was not significantly increased but the av. chain length of **amylopectin** was greater, resulting in an increase in apparent **amylose**

content as judged by iodine binding. In addn., the **starch** had much higher levels of phosphorous.

ST **starch** branching enzyme isoenzyme **potato** cDNA sequence

IT Leaf

Plastid

**Potato (Solanum tuberosum)**

Protein sequences

**Tuber** (plant organ)

cDNA sequences

(minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: cloning and characterization of multiple forms of SBE A)

IT Chloroplast

(stroma; minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: cloning and characterization of multiple forms of SBE A)

IT 184855-10-5 239792-06-4 239792-07-5 239792-08-6 239792-09-7  
239792-10-0 239792-11-1

RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence)

(amino acid sequence; minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: cloning and characterization of multiple forms of SBE A)

IT **9001-97-2, Starch** branching enzyme

RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence)

(minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: cloning and characterization of multiple forms of SBE A)

IT **9005-25-8, Starch**, biological studies **9005-82-7**

, **Amylose 9037-22-3, Amylopectin**

RL: BSU (Biological study, unclassified); MFM (Metabolic formation); PRP (Properties); BIOL (Biological study); FORM (Formation, nonpreparative)

(minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: cloning and characterization of multiple forms of SBE A)

IT 7723-14-0, Phosphorus, biological studies

RL: BOC (Biological occurrence); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence)

(minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: phosphorus levels in **starch**)

IT 225559-14-8, GenBank AJ011885 225559-15-9, GenBank AJ011886 225559-16-0, GenBank AJ011887 225559-17-1, GenBank AJ011888 225559-18-2, GenBank AJ011889 225559-19-3, GenBank AJ011890 225559-20-6, GenBank AJ011891

RL: BOC (Biological occurrence); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence)

(nucleotide sequence; minor form of **starch** branching enzyme in **potato tubers** has major effect on **starch** structure: cloning and characterization of multiple forms of SBE A)

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L49 ANSWER 11 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:194160 HCAPLUS

DN 130:233256

TI Improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes

IN **Jobling, Stephen Alan; Schwall, Gerhard Peter; Westcott, Roger John**

PA National Starch and Chemical Investment Holding Corporation, USA

SO PCT Int. Appl., 51 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C07H021-00

CC 3-2 (Biochemical Genetics)

Section cross-reference(s): 7, 11

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9912950	A2	19990318	WO 1998-GB2665	19980904 <--
	WO 9912950	A3	19990506		
	W: AU, CA, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2302639	AA	19990318	CA 1998-2302639	19980904 <--
	AU 9889911	A1	19990329	AU 1998-89911	19980904 <--
	EP 1009751	A2	20000621	EP 1998-941593	19980904 <--

R: AT, BE, DE, DK, ES, FR, GB, GR, IT, NL, SE, PT, FI

PRAI GB 1997-18863 A 19970906 <--  
 WO 1998-GB2665 W 19980904 <--

AB Disclosed are nucleic acid sequences obtainable from **potato** plants and carrying at least a portion of an isoamylase enzyme gene, together with constructs and host cells comprising the nucleic acid sequence, and methods of using the nucleic acid sequence. Thus, cDNA and genomic clones encoding isoamylase-type and pullulanase-type debranching enzymes from **potato** are provided. A plant transformation vector with the hygromycin selectable marker is constructed in which a 1.5-kb isoamylase cDNA from plasmid pSJ132 is inserted in an antisense orientation under the control of granule-bound **starch** synthase promoter. The vector (pSJ138) is used to transform wild-type and waxy **potato** plants.

ST isoamylase pullulanase gene cDNA sequence **potato**; plant **starch** transformation isoamylase pullulanase

IT Barley  
 Cassava (*Manihot esculenta*)  
 Corn  
 Genetic engineering  
 Molecular cloning  
 Oat  
 Pea  
 Plant (Embryophyta)  
**Potato (Solanum tuberosum)**  
 Rice (*Oryza sativa*)  
 Sweet **potato**  
 Transformation, genetic  
 Wheat  
 (improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes)

IT Gene, plant  
 RL: BPN (Biosynthetic preparation); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); PREP (Preparation); USES (Uses) (improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes)

IT 221267-04-5P 221267-11-4P  
 RL: BPN (Biosynthetic preparation); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); PREP (Preparation); USES (Uses) (amino acid sequence; improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes)

IT 9067-73-6P, Isoamylase **9075-68-7P**, Pullulanase  
 RL: BPN (Biosynthetic preparation); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); PREP (Preparation); USES (Uses) (improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes)

IT **9005-25-8, Starch**, biological studies  
 RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process) (improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes)

IT 221266-62-2P 221266-65-5P 221266-68-8P 221266-70-2P 221266-75-7P  
 221266-79-1P 221266-87-1P 221266-95-1P 221267-00-1P 221267-07-8P  
 RL: BPN (Biosynthetic preparation); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); PREP (Preparation); USES (Uses) (nucleotide sequence; improvements in or relating to stability of plant **starches** by transformation with isoamylase-type or pullulanase-type debranching enzymes)

L49 ANSWER 12 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
AN 1999:180580 HCAPLUS  
DN 131:2771  
TI A combined reduction in activity of **starch** synthases II and III of **potato** has novel effects on the **starch** of **tubers**  
AU Edwards, Anne; Fulton, Daniel C.; Hylton, Christopher M.; Jobling, Stephen A.; Gidley, Michael; Rossner, Ute; Martin, Cathie; Smith, Alison M.  
CS John Innes Centre, Norwich, NR4 7UH, UK  
SO Plant Journal (1999), 17(3), 251-261  
CODEN: PLJUED; ISSN: 0960-7412  
PB Blackwell Science Ltd.  
DT Journal  
LA English  
CC 11-1 (Plant Biochemistry)  
AB A chimeric antisense construct has been used to generate transgenic **potatoes** (*Solanum tuberosum* L.) in which activities of both of the main **starch** synthases responsible for **amylopectin** synthesis in the **tuber** (SSII and SSIII) are reduced. The properties of **starch** from **tubers** of these plants have been compared with those of **starches** from transgenic plants in which activity of either SSII or SSIII has been reduced. **Starches** from the three types of transgenic plant are qual. different from each other and from the **starch** of control plants with unaltered **starch** synthase activities, with respect to granule morphol., the branch lengths of **amylopectin**, and the gelatinization behavior analyzed by viscometry. The effects of reducing SSII and SSIII together cannot be predicted from consideration of the effects of reducing these two isoforms individually. These results indicate that different isoforms of **starch** synthase make distinct contributions to the synthesis of **amylopectin**, and that they act in a synergistic manner, rather than independently, during **amylopectin** synthesis.  
ST **starch** synthase isoform **amylopectin** potato  
IT **Potato** (*Solanum tuberosum*)  
(combined redn. in activity of **starch** synthases II and III of **potato** has novel effects on the **starch** of **tubers**)  
IT 9030-10-8, **Starch** synthase  
RL: BSU (Biological study, unclassified); BIOL (Biological study) (I and II; combined redn. in activity of **starch** synthases II and III of **potato** has novel effects on the **starch** of **tubers**)  
IT 9037-22-3, **Amylopectin**  
RL: BOC (Biological occurrence); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); OCCU (Occurrence); PROC (Process)  
(combined redn. in activity of **starch** synthases II and III of **potato** has novel effects on the **starch** of **tubers**)  
IT 9005-25-8, **Starch**, biological studies  
RL: BOC (Biological occurrence); BPR (Biological process); BSU (Biological study, unclassified); PRP (**Properties**); BIOL (Biological study); OCCU (Occurrence); PROC (Process)  
(combined redn. in activity of **starch** synthases II and III of **potato** has novel effects on the **starch** of **tubers**)  
RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L49 ANSWER 13 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:609257 HCAPLUS

DN 129:315237

TI Rheological Properties of Sago **Starch**

AU Ahmad, Fasihuddin B.; Williams, Peter A.

CS Centre For Water Soluble Polymers, North East Wales Institute, Wrexham, LL11 2AW, UK

SO Journal of Agricultural and Food Chemistry (1998), 46(10), 4060-4065

CODEN: JAFCAU; ISSN: 0021-8561

PB American Chemical Society

DT Journal

LA English

CC 17-4 (Food and Feed Chemistry)

AB The swelling characteristics and rheol. properties of 11 sago **starches** were studied and compared to a no. of commonly used **starches**. The swelling power of the sago **starches** were all very similar except for 2 samples which were known to contain a lower mol. mass **amylose** component. The swelling and soly. for these 2 samples were higher than the rest. The values for sago **starches** were similar to that for **potato** and **tapioca starch**, but higher than **maize** and **pea starch**. The storage modulus,  $G'$ , of the sago **starches** as studied by small deformation oscillation measurements showed a rapid initial increase in  $G'$  followed by the development of a pseudo-plateau. The dependence of  $G'$  on the mol. mass of the **amylose** followed the relationship  $G' \text{ .varies. } M^{-0.4}$ . Gels were formed only at sago **starch** concns. of  $>3.5\%$ , corresponding to an **amylose** concn. of .apprx.  $1.0\%$  and varied with concn. according to the relationship  $G' \text{ .varies. } C^{1.8}$  and  $G' \text{ .varies. } C^{2.5}$  for high and low **amylose** mol. mass samples, resp. Gel strength (GS) measurements also confirmed that the min. concn. for gelation was .apprx.  $3.5\%$  and that GS .varies.  $C^{2.0}$ . Sago **starches** showed good **freeze-thaw** stability compared to other **starch** types.

ST Sago **starch** rheol property

IT Food rheology

(of Sago **starch**)

IT Food functional properties

Food gelling

Food solubility

Food swelling

**Freezing**

(rheol. properties of Sago starch)

IT 9005-25-8, Starch, properties

RL: PRP (Properties)

(Sago; rheol. properties of)

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L49 ANSWER 14 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:508745 HCAPLUS

DN 129:214130

TI Consequences of antisense RNA inhibition of starch branching enzyme activity on properties of potato starch

AU Safford, Richard; Jobling, Steve A.; Sidebottom, Chris M.; Westcott, Roger J.; Cooke, David; Tober, Karen J.; Strongitharm, Barbara H.; Russell, Alison L.; Gidley, Michael J.

CS Biosciences Division, Unilever Research, Sharnbrook, MK 441LQ, UK

SO Carbohydrate Polymers (1998), 35(3-4), 155-168

CODEN: CAPOD8; ISSN: 0144-8617

PB Elsevier Science Ltd.

DT Journal

LA English

CC 11-1 (Plant Biochemistry)

Section cross-reference(s): 7, 33

AB Antisense constructs contg. cDNAs for **potato starch** branching enzyme (SBE) were introduced into **potato** (**Solanum tuberosum** L.). A population of transgenic plants were generated in which **tuber** SBE activity was reduced by between 5 and 98% of control values. No significant differences in **amylose** content or **amylopectin** branch length profiles of transgenic **tuber starches** were obsd. as a function of **tuber** SBE activity. **Starches** obtained from low SBE activity plants showed elevated phosphorus content. <sup>31</sup>P-NMR anal. showed that this was due to proportionate increases in both 3- and 6-linked **starch** phosphates. A consistent alteration in **starch** gelatinization properties was only obsd. when the level of SBE activity was reduced to below .apprx.5% of that of control values. **Starches** from these low SBE activity plants showed increases of up to 5.degree.C in d.s.c. peak **temp.** and viscosity onset **temp.** Studies on melting of crystallites obtained from linear (1 .fwdarw. 4)-.alpha.-D-**glucan** oligomers suggest that an av. difference of double helix length of about one glucose residue might be sufficient to account for the obsd. differences in gelatinization properties. It is postulated that the modification of gelatinization properties at low SBE activities is due to a subtle alteration in **amylopectin** branch patterns resulting in small changes in double helix lengths within granules.

ST **potato starch** property branching enzyme antisense

IT **Potato (Solanum tuberosum)**

(transgenic; consequences of antisense RNA inhibition of **starch** branching enzyme activity on properties of **potato starch**)

IT 7723-14-0, Phosphorus, biological studies 9037-22-3,

**Amylopectin**

RL: BOC (Biological occurrence); BSU (Biological study, unclassified);

BIOL (Biological study); OCCU (Occurrence)

(consequences of antisense RNA inhibition of **starch** branching enzyme activity on properties of **potato starch**)

IT 9005-25-8, **Starch**, biological studies

RL: BOC (Biological occurrence); BSU (Biological study, unclassified);

**PRP (Properties)**; BIOL (Biological study); OCCU (Occurrence)

(consequences of antisense RNA inhibition of **starch** branching enzyme activity on properties of **potato starch**)

IT 9001-97-2, **Starch** branching enzyme

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(consequences of antisense RNA inhibition of **starch** branching enzyme activity on properties of **potato starch**)

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L49 ANSWER 15 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:324901 HCAPLUS

DN 129:37231

TI Cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants

IN **Jobling, Stephen Alan**; Safford, Richard

PA National Starch and Chemical Investment Holding Corporation, USA; Jobling, Stephen Alan; Safford, Richard

SO PCT Int. Appl., 67 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C12N015-82

ICS C12N009-10; C12Q001-68; C12N001-21; C12N015-54; A01H005-00

CC 3-2 (Biochemical Genetics)

Section cross-reference(s): 7, 11

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
	-----	---	-----	-----	-----	
PI	WO 9820145	A2	19980514	WO 1997-GB3032	19971104	<--
	W: AU, BR, CA, JP, KR, US					
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE					
	AU 9748747	A1	19980529	AU 1997-48747	19971104	<--
	AU 730900	B2	20010315			
	GB 2320716	A1	19980701	GB 1997-23142	19971104	<--
	GB 2320716	B2	20010620			
	EP 941352	A2	19990915	EP 1997-911332	19971104	<--
	R: AT, BE, DE, DK, ES, FR, GR, IT, NL, SE, PT, FI					
PRAI	GB 1996-23095	A	19961105			<--
	WO 1997-GB3032	W	19971104			<--

AB Disclosed is a nucleic acid sequence encoding a polypeptide having **starch** branching enzyme (SBE) activity, the encoded polypeptide comprising an effective portion of the amino acid sequence. The SBE is .alpha.-**glucan**-branching glycosyltransferase type II. The SBE is derived from cassava (*Manihot esculenta*), and can be cloned on plasmid vectors and expressed in *Escherichia coli* and plant hosts. Suitable plant hosts include cassava, banana, **potato**, pea, tomato, corn, wheat, barley, oat, sweet **potato**, or rice. Genetically engineered deletion mutant forms of SBE are also claimed.

ST **starch** branching enzyme gene sequence cloning; cassava **starch** branching enzyme gene cloning; **glucan** branching

- glycosyltransferase gene cassava
- IT Banana (Musa)
- Barley
- Corn
- Genetic engineering
- Molecular cloning
- Oat
- Pea
- Potato (*Solanum tuberosum*)
- Protein sequences
- Rice (*Oryza sativa*)
- Sweet potato
- Tomato
- Wheat
- cDNA sequences
- (cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT Antisense RNA
- RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)
- (cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT Gene
- (expression, antisense inhibition; cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT Gene, plant
- RL: AGR (Agricultural use); BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process); USES (Uses)
- (for **starch**-branching enzymes, of cassava; cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT Cassava (*Manihot esculenta*)
- (**starch**-branching enzymes from; cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT 208408-78-0 208408-80-4
- RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
- (amino acid sequence; cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT 9005-25-8, **Starch**, biological studies
- RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
- (cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT 208408-77-9 208408-79-1
- RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)
- (nucleotide sequence; cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)
- IT 9001-97-2, **Starch**-branching enzyme
- RL: AGR (Agricultural use); FFD (Food or feed use); BIOL (Biological study); USES (Uses)
- (type II; cloning and sequence of **starch**-branching enzyme genes of cassava for improvements in or relating to **starch** content of plants)

L49 ANSWER 16 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1997:111211 HCAPLUS  
 DN 126:117274  
 TI **Thermally**-inhibited pregelatinized non-granular **starches**  
 and flours and process for their production  
 IN Jeffcoat, Roger; Chiu, Chung-Wai; Shah, Manish B.; Thomas, David J.;  
 Hanchett, Douglas J.  
 PA National Starch and Chemical Investment Holding Co, USA  
 SO PCT Int. Appl., 38 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C08B030-14  
 ICS A23L001-0522  
 CC 17-11 (Food and Feed Chemistry)  
 FAN.CNT 12

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 9640794	A1	19961219	WO 1996-US7076	19960516	<--
	W:	AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
	RW:	KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
	US 5720822	A	19980224	US 1995-476963	19950607	<--
	CA 2221510	AA	19961219	CA 1996-2221510	19960516	<--
	AU 9658614	A1	19961230	AU 1996-58614	19960516	<--
	AU 700049	B2	19981217			
	EP 830379	A1	19980325	EP 1996-920247	19960516	<--
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 11506798	T2	19990615	JP 1996-500586	19960516	<--
	BR 9609095	A	20000328	BR 1996-9095	19960516	<--
	EP 1159880	A2	20011205	EP 2001-120646	19960516	<--
	EP 1159880	A3	20020102			
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	US 6010574	A	20000104	US 1997-959087	19971028	<--
	US 6261376	B1	20010717	US 1999-436671	19991110	<--
PRAI	US 1995-476963	A	19950607			<--
	EP 1996-920247	A3	19960516			<--
	WO 1996-US7076	W	19960516			<--
	US 1997-959087	A1	19971028			<--
AB	<b>Thermally</b> -inhibited, pregelatinized non-granular <b>starches</b> and flours are prepd. by pregelatinizing the <b>starch</b> or flour and <b>thermally</b> inhibiting the <b>starch</b> or flour by dehydrating the <b>starch</b> or flour to anhyd. or substantially anhyd. forms and then <b>heat</b> -treating the dehydrated <b>starch</b> . The pregelatinization may be carried out prior to or after the <b>thermal</b> inhibition using known methods which disrupt the granular structure such as by drum-drying or jet-cooking and spray-drying. Preferably the <b>starch</b> or flour is adjusted to a pH above 7.0 prior to the <b>thermal</b> inhibition. The <b>starch</b> may be dehydrated by <b>heating</b> the <b>starch</b> in a suitable <b>heating</b> app., by extg. the water from the <b>starch</b> using a solvent such as ethanol, or by <b>freeze</b> -drying the <b>starch</b> . Preferably the <b>starch</b> or flour is treated with a solvent to remove proteins and/or lipids and thus prevent off-flavors.					
ST	<b>starch</b> pregelatinized flour					
IT	Drying (drum; <b>thermally</b> -inhibited pregelatinized non-granular					

starches and flours)  
 IT Cooking  
 (extrusion; **thermally**-inhibited pregelatinized non-granular  
 starches and flours)  
 IT Flavor  
 (off-flavor; **thermally**-inhibited pregelatinized non-granular  
 starches and flours)  
 IT Drying  
 (spray; **thermally**-inhibited pregelatinized non-granular  
 starches and flours)  
 IT Amaranthus  
 Banana (Musa)  
 Barley  
 Cassava (Manihot esculenta)  
 Corn  
 Flours and Meals  
 Food gelling  
 Food viscosity  
 Pea  
 Potato (**Solanum tuberosum**)  
 Rice (Oryza sativa)  
 Sago palm  
 Sorghum  
 Sweet potato  
 Wheat  
 (thermally-inhibited pregelatinized non-granular  
 starches and flours)  
 IT 64-17-5, Ethanol, biological studies  
 RL: FFD (Food or feed use); BIOL (Biological study); USES (Uses)  
 (thermally-inhibited pregelatinized non-granular  
 starches and flours)  
 IT 9005-25-8, Starch, biological studies 9005-82-7  
 , Amylose 9037-22-3, Waxy starch  
 RL: FFD (Food or feed use); PEP (Physical, engineering or chemical  
 process); PRP (**Properties**); BIOL (Biological study); PROC  
 (Process); USES (Uses)  
 (thermally-inhibited pregelatinized non-granular  
 starches and flours)  
 IT 10025-87-3, Phosphorus oxychloride  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (thermally-inhibited pregelatinized non-granular  
 starches and flours)

L49 ANSWER 17 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1997:12611 HCAPLUS  
 DN 126:44371  
 TI A class A **starch** branching enzyme gene from **potato** and  
 its use in altering the properties of plant **starches**  
 IN Cooke, David; Debet, Martine; Gidley, Michael John; Jobling, Stephen  
 Alan; Safford, Richard; Sidebottom, Christopher Michael;  
 Westcott, Roger John  
 PA National Starch and Chemical Investment Holding Corp., USA; Cooke, David;  
 Debet, Martine; Gidley, Michael John; Jobling, Stephen Alan; Safford,  
 Richard; Sidebottom, Christopher Michael; Westcott, Roger John  
 SO PCT Int. Appl., 140 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C12N015-82  
 ICS C12N015-54; C08B030-04; A01H005-00  
 CC 7-2 (Enzymes)  
 Section cross-reference(s): 3, 11, 17, 44  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9634968	A2	19961107	WO 1996-GB1075	19960503 <--
	WO 9634968	A3	19961205		
	W: AU, BR, CA, JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2217878	AA	19961107	CA 1996-2217878	19960503 <--
	AU 9655099	A1	19961121	AU 1996-55099	19960503 <--
	AU 706009	B2	19990603		
	EP 826061	A2	19980304	EP 1996-912161	19960503 <--
	R: AT, BE, DE, DK, ES, FR, GB, GR, IT, NL, SE, PT, FI				
PRAI	GB 1995-9229		19950505	<--	
	GB 1996-7409		19960410	<--	
	WO 1996-GB1075		19960503	<--	
AB	A cDNA for a class A <b>starch</b> branching enzyme (SBE) of <b>potato</b> is cloned and characterized for expression in other plants to alter the properties of their <b>starches</b> . A cDNA was cloned by PCR using primers derived from conserved peptides of other SBEs. <b>Potato</b> plants transformed combinations of sense and antisense expression constructs for class A and B SBEs were pred. and the properties of their <b>starches</b> characterized. Plants carrying antisense DNA to class A and class B enzymes had <b>amylose</b> as the main constituent of their <b>starch</b> . The pasting onset <b>temps</b> . of their <b>starches</b> were increased by 25-30.degree.. Data from other transformants indicated that most of the effects were due to inhibition of class A gene expression.				
ST	<b>starch</b> branching enzyme cDNA <b>potato</b> ; <b>amylose</b> <b>starch</b> branching enzyme <b>potato</b> ; <b>amylopectin</b> <b>starch</b> branching enzyme <b>potato</b>				
IT	<b>Potato (Solanum tuberosum)</b> (class A <b>starch</b> branching enzyme gene from <b>potato</b> and its use in altering properties of plant <b>starches</b> )				
IT	Gene, plant RL: AGR (Agricultural use); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses) (class A <b>starch</b> branching enzyme gene from <b>potato</b> and its use in altering properties of plant <b>starches</b> )				
IT	Barley Cassava (Manihot esculenta) Corn Pea Rice (Oryza sativa) Sweet <b>potato</b> Tomato Wheat (expression of <b>potato starch</b> branching enzyme DNA in; class A <b>starch</b> branching enzyme gene from <b>potato</b> and its use in altering properties of plant <b>starches</b> )				
IT	cDNA sequences (for <b>starch</b> branching enzyme of <b>potato</b> ; class A <b>starch</b> branching enzyme gene from <b>potato</b> and its use in altering properties of plant <b>starches</b> )				
IT	Genetic polymorphism (in <b>starch</b> branching enzyme genes of <b>potato</b> ; class A <b>starch</b> branching enzyme gene from <b>potato</b> and its use in altering properties of plant <b>starches</b> )				
IT	Protein sequences (of <b>starch</b> branching enzyme of <b>potato</b> ; class A <b>starch</b> branching enzyme gene from <b>potato</b> and its use in altering properties of plant <b>starches</b> )				
IT	Transit peptides RL: BOC (Biological occurrence); BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study);				

- OCCU (Occurrence); USES (Uses)  
 (of **starch** branching enzyme of **potato**; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Plasmids  
 (pSJ64, **potato starch** branching enzyme cDNA on, expression in transgenic **potato** of; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Plasmids  
 (pSJ90, **potato starch** branching enzyme cDNA on, expression in Escherichia coli of; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Genetic element  
 RL: BOC (Biological occurrence); BSU (Biological study, unclassified); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); USES (Uses)  
 (signal sequence, of **starch** branching enzyme gene of **potato**; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Coating materials  
 Dietary fiber  
 Gelation agents  
 (**starch** with altered compn. and properties for use as; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Glass fibers, miscellaneous  
 RL: MSC (Miscellaneous)  
 (**starch** with altered compn. and properties for use in prepn. of; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Adhesives  
 Films  
 Packaging materials  
 Textiles  
 (**starch** with altered compn. and properties for use in; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT Antisense DNA  
 RL: AGR (Agricultural use); BIOL (Biological study); USES (Uses)  
 (to **starch** branching enzyme of **potato**; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT 9005-25-8P, **Starch**, properties  
 RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)  
 (alteration of properties of; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT 184855-10-5 184855-12-7 184855-20-7 184855-21-8  
 RL: AGR (Agricultural use); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (amino acid sequence; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant **starches**)
- IT 184855-11-6 184855-13-8 184855-14-9 184855-15-0 184855-16-1  
 184855-17-2 184855-18-3 184855-19-4  
 RL: AGR (Agricultural use); BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)  
 (nucleotide sequence; class A **starch** branching enzyme gene from **potato** and its use in altering properties of plant

- starches)**
- IT 9001-97-2, **Starch** branching enzyme  
RL: AGR (Agricultural use); PRP (Properties); BIOL (Biological study);  
USES (Uses)  
(**starch** branching enzyme gene from **potato** and its  
use in altering properties of plant **starches**)
- IT 9005-82-7P, **Amylose** 9037-22-3P,  
**Amylopectin** 14265-44-2P, Phosphate, properties  
RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological  
study); PREP (Preparation)  
(**starch** with altered content of; class A **starch**  
branching enzyme gene from **potato** and its use in altering  
properties of plant **starches**)
- L49 ANSWER 18 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
AN 1996:737319 HCAPLUS  
DN 126:135547  
TI A new generation of **starch** products as excipient in  
pharmaceutical tablets. II. High surface area retrograded pregelatinized  
**potato starch** products in sustained-release tablets  
AU Te Wierik, G. Henk P.; Eissens, Anko C.; Bergsma, Jack; Arends-Scholte, A.  
Willemien; Lerk, Coenraad F.  
CS Groningen Institute for Drug Studies (GIDS), Department of Pharmaceutical  
Technology and Biopharmacy, University of Groningen, Ant. Deusinglaan 1,  
AV Groningen, 9713, Neth.  
SO Journal of Controlled Release (1997), 45(1), 25-33  
CODEN: JCREEC; ISSN: 0168-3659  
PB Elsevier  
DT Journal  
LA English  
CC 63-6 (Pharmaceuticals)  
AB A new linear short-chain **starch** product was prepd. by  
gelatinization of **potato starch** followed by enzymic  
degrdn., pptn. (retrogradation) and filtration. A high sp. surface area  
was subsequently created by washing with ethanol or acetone or  
**freeze-drying**. Tablets compressed from a mixt. contg. the  
**starch** product and 30% theophylline at a force of at least 15 kN  
showed no disintegration and an almost const. (zero-order) sustained drug  
release. The delivery from these non-porous tablets proved to be a  
swelling-controlled solvent-activated mechanism, as was confirmed by the  
slow penetration of a solvent front into the tablet. Drug release was not  
affected by the incorporation of magnesium stearate into the tablet or the  
presence of .alpha.-amylase in the dissoln. medium, both features in  
contrast to similar tablets compressed from conventional pregelatinized  
**starches**, which were prepd. by gelatinization followed directly by  
**thermal** dehydration. A sp. surface area of 1.5 m2/g proved to be  
a prerequisite for the **starch** product to control drug release.  
A high surface area (linear long-chain) **amylose** product showed a  
sustained but less linear release profile. Branched short and long-chain  
products with a high surface area produced disintegrating tablets and are  
therefore not able to control drug release.
- ST surface area pregelatinized **potato starch** tablet;  
sustained release tablet **starch** surface area
- IT Dissolution rate  
Surface area  
(pregelatinized **potato starch** products in  
sustained-release tablets)
- IT Drug delivery systems  
(tablets, sustained-release; pregelatinized **potato**  
**starch** products in sustained-release tablets)
- IT 9005-82-7, **Amylose** 9037-22-3,  
**Amylopectin**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)

(pregelatinized **potato starch** products in sustained-release tablets)

IT 9005-25-8, **Starch**, biological studies  
 RL: PRP (**Properties**); THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
 (pregelatinized **potato starch** products in sustained-release tablets)

IT 58-55-9, Theophylline, biological studies 557-04-0, Magnesium stearate  
 RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
 (pregelatinized **potato starch** products in sustained-release tablets)

L49 ANSWER 19 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1995:986444 HCAPLUS  
 DN 124:11302  
 TI Method for producing altered **starch** from **potato** plants  
 IN Cooke, David; Gidley, Michael John; Jobling, Stephen Alan; Safford, Richard; Sidebottom, Christopher Michael; Westcott, Roger John  
 PA National Starch and Chemical Investment Holding Corp., USA  
 SO PCT Int. Appl., 36 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C12N015-82  
 ICS C12N015-11; A01H005-00; C08B030-14  
 CC 44-6 (Industrial Carbohydrates)  
 Section cross-reference(s): 3, 7, 11, 17  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9526407	A1	19951005	WO 1995-GB634	19950322 <--
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
CA 2186399	AA	19951005	CA 1995-2186399	19950322 <--
CA 2186399	C	20010904		
AU 9519028	A1	19951017	AU 1995-19028	19950322 <--
AU 688006	B2	19980305		
EP 754235	A1	19970122	EP 1995-911460	19950322 <--
R: AT, BE, DE, ES, FR, GB, IT, NL, SE				
US 6103893	A	20000815	US 1996-716449	19960924 <--
PRAI GB 1994-6022	A	19940325 <--		
EP 1994-305806	A	19940804 <--		
EP 1995-300210	A	19950113 <--		
WO 1995-GB634	W	19950322 <--		
AB Disclosed is a method of producing altered <b>starch</b> from transformed <b>potato</b> plants or their progeny, comprising extg. <b>starch</b> from a <b>potato</b> plant, at least the <b>tubers</b> of which comprise at least an effective portion of a <b>starch</b> branching enzyme (SBE) cDNA sequence operably linked in the antisense orientation to a suitable promoter, such that the level of SBE activity is limited to less than 0.8 units per g <b>tuber</b> . Also disclosed are <b>potato</b> plants comprising altered <b>starch</b> in accordance with the invention.				
ST <b>starch</b> altered prodn <b>potato</b> transgenosis; enzyme <b>starch</b> branching cDNA sequence <b>potato</b>				
IT Gelation <b>Tuber</b> (plant organ) (method for producing altered <b>starch</b> from transgenic				



- potato** plants using **starch** branching enzyme regulation)
- IT Virus, plant  
(cauliflower mosaic, method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT Deoxyribonucleic acid sequences  
(complementary, method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT Glycoproteins, specific or class  
RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(patatins, method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT Genetic element  
RL: BUU (Biological use, unclassified); FFD (Food or feed use); BIOL (Biological study); USES (Uses)  
(promoter, method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT Transformation, genetic  
(transgenic, method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT 9030-10-8, **Starch** synthase  
RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(granule-bound; method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT 9005-25-8DP, **Starch**, altered derivs.  
RL: BMF (Bioindustrial manufacture); FFD (Food or feed use); PUR (Purification or recovery); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT 9001-97-2P, **Starch** branching enzyme  
RL: BPN (Biosynthetic preparation); BUU (Biological use, unclassified); FFD (Food or feed use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)
- IT 171545-22-5  
RL: BPR (Biological process); BSU (Biological study, unclassified); BUU (Biological use, unclassified); FFD (Food or feed use); PRP (Properties); BIOL (Biological study); PROC (Process); USES (Uses)  
(method for producing altered **starch** from transgenic **potato** plants using **starch** branching enzyme regulation)

L49 ANSWER 20 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1993:537770 HCAPLUS

DN 119:137770

TI **Thermal** behavior of **potato amylose** and enzyme-resistant **starch** from maize

AU Sievert, D.; Wuersch, P.

CS Nestle Res. Cent., Lausanne, 1000, Switz.

SO Cereal Chemistry (1993), 70(3), 333-8

CODEN: CECHAF; ISSN: 0009-0352

DT Journal

LA English

- CC 17-2 (Food and Feed Chemistry)  
AB The **thermal** properties of **potato amylose** (d.p. 5500) and of enzyme-resistant **starch** (RS) (d.p. 65) from autoclaved maize **starch** in a concd. aq. system (22%, wt./wt.) were studied by differential scanning calorimetry (DSC). **Heating** of **amylose** and RS in the DSC instrument to 180.degree. ( **heating** rate 5.degree./min) gave melting transitions at 153.6 and 139.8.degree., resp., indicating disordering of fairly thermostable regions. This **heating** to high **temps.** was accompanied by a partial **thermal** degrdn. of the linear **amylose** and RS chains. Reappearance of endotherms during repeated **heating** and the appearance of exotherms during each **cooling** phase suggested (re)assocn. of chains from the polymer melts of both **amylose** and RS. Assocn. of **amylose** and RS chains appeared to start between 80-75.degree. and 60-55.degree., resp. Whereas interactions between the long **amylose** chains were reduced at **cooling** rates of >10.degree./min, interchain contacts between the shorter RS chains seemed not to be affected by the rate of **cooling**. In the presence of the complexing agent L-.alpha.-lysophosphatidylcholine (LPC), the process of assocn. of linear chains was competitively affected by the formation of inclusion complexes of the linear chains with LPC. At an LPC concn. of 10% (wt./wt.), complex formation dominated, and no assocn. of **amylose** or RS chains was obsd.
- ST **potato amylose thermal** behavior; corn **starch** enzyme resistant **thermal** behavior; **thermal** behavior **potato amylose** corn **starch**
- IT **Potato**  
(**amylose** of, **thermal** behavior of)
- IT **Thermal** property  
(of **potato amylose** and enzyme-resistant corn **starch**)
- IT **Heat** of fusion and **Heat** of **freezing**  
(of **potato amylose** and enzyme-resistant corn **starch**, factors affecting)
- IT Lysophosphatidylcholines  
RL: BIOL (Biological study)  
(**thermal** behavior of **potato amylose** and enzyme-resistant corn **starch** response to complexing with)
- IT 9005-82-7, **Amylose**  
RL: PROC (Process)  
(of **potato**, **thermal** behavior of)
- IT 9005-25-8, **Starch**, properties  
RL: PRP (Properties)  
(**thermal** behavior of corn enzyme-resistant)
- L49 ANSWER 21 OF 22 HCAPLUS COPYRIGHT 2003 ACS  
AN 1984:87607 HCAPLUS  
DN 100:87607  
TI Reactivity of **amylose** and **amylopectin** in **potato starch**  
AU Steeneken, P. A. M.  
CS Potato Proc. Res. Inst., TNO, Groningen, 9723 CC, Neth.  
SO Starch/Staerke (1984), 36(1), 13-18  
CODEN: STARDD; ISSN: 0038-9056  
DT Journal  
LA English  
CC 44-6 (Industrial Carbohydrates)  
AB The reactivity of amylase(I) and **amylopectin**(II) in **potato starch** (III) to (diethylamino)ethyl chloride (IV) was investigated by etherifying III with IV to a low substitution degree (SD) and detg. the distribution of ether groups on I and II. At almost

equal SD, the I in granular III showed higher reactivity than in soln. in comparison to II, indicating that there is a difference in phys. state between I and II in granular III. The relative reactivity of I and II can be varied by the modification of native III, such as milling, **freeze-thaw** and **heat-moisture** treatment and chems.-activation.

ST diethylaminoethyl amylase formation reactivity **starch**;

**amylopectin** diethylaminoethyl formation reactivity **starch**

IT 9005-25-8, properties

RL: PRP (Properties)

((diethylamino)ethyl **amylose** and **amylopectin**  
formation in, reactivity in relation to)

IT 58834-27-8P 88922-68-3P

RL: BYP (Byproduct); PREP (Preparation)

(formation of, in **starch**, reactivity in relation to)

IT 56-81-5, uses and miscellaneous 110-86-1, uses and miscellaneous

7732-18-5, uses and miscellaneous

RL: USES (Uses)

(**starch** treated with, (diethylamino)ethyl **amylose**  
and **amylopectin** formation in, reactivity in relation to)

L49 ANSWER 22 OF 22 HCAPLUS COPYRIGHT 2003 ACS

AN 1971:539462 HCAPLUS

DN 75:139462

TI Examination on the influence of **freeze**-drying on crystalline  
**starch** structure by x-ray diffractometry

AU Robin, J. P.; Duprat, F.; Charbonniere, R.; Guilbot, A.

CS Inst. Natl. Rech. Agron., Massy, Fr.

SO Staerke (1971), 23(9), 320-5

CODEN: STRKA6; ISSN: 0038-9056

DT Journal

LA French

CC 17 (Foods)

AB The influence of **freeze**-drying on the cryst. structure of various **starches** (**potato**, wheat, maize, waxy maize, manioc, arrowroot) and wheat **amylose** was examd. by means of x-ray diffractometric diagrams. Only the cryst. structure of **potato starch** is altered by the treatment. A change in structure becomes apparent only if **freeze**-drying is done slowly and if the water content of **starch** is above 25%, related to dry substance. However, a restoration of the original structure of **starch** is possible, by mositening under certain conditions. An explanation for the observations is proposed by means of a new hypothesis on structure organization of **starch** granules as well as the role of water as a detg. factor for organization.

ST **starch** structure **freeze** drying

IT Drying

(**freeze**-, of **starch**, cryst. structure in relation  
to)

IT 9005-25-8, properties

RL: PRP (Properties)

(cryst. structure of, **freeze**-drying effect on)

=> fil reg

FILE 'REGISTRY' ENTERED AT 11:01:05 ON 25 APR 2003

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provided by InfoChem.

STRUCTURE FILE UPDATES: 23 APR 2003 HIGHEST RN 504385-01-7  
DICTIONARY FILE UPDATES: 23 APR 2003 HIGHEST RN 504385-01-7

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2003

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP  
PROPERTIES for more information. See STNote 27, Searching Properties  
in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=> d ide can tot

L50 ANSWER 1 OF 8 REGISTRY COPYRIGHT 2003 ACS  
RN 330869-84-6 REGISTRY  
CN Glucosyltransferase, adenosine diphosphoglucose-starch (Solanum tuberosum  
strain AM79.7322 gene amf) (9CI) (CA INDEX NAME)  
FS PROTEIN SEQUENCE  
MF Unspecified  
CI MAN  
SR CA  
LC STN Files: CA, CAPLUS

\*\*RELATED SEQUENCES AVAILABLE WITH SEQLINK\*\*

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*  
\*\*\* USE 'SQD' OR 'SQIDE' FORMATS TO DISPLAY SEQUENCE \*\*\*  
1 REFERENCES IN FILE CA (1962 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 134:249650

L50 ANSWER 2 OF 8 REGISTRY COPYRIGHT 2003 ACS  
RN 9075-68-7 REGISTRY  
CN Pullulanase (9CI) (CA INDEX NAME)  
OTHER NAMES:  
CN .alpha.-Dextrin 6-glucanohydrolase  
CN Amylo-1,6-.alpha.-glucosidase  
CN Amylopectin 6-glucanohydrolase  
CN Amylopectin-1,6-.beta.-glucohydrolase  
CN Amylux S  
CN Debranching enzyme  
CN E.C. 3.2.1.41  
CN E.C. 3.2.1.69  
CN Glucanohydrolase, amylopectin 6-  
CN Glucoamylase P  
CN Limit dextrinase  
CN Optimax 300L  
CN Plunaz  
CN Promozyme  
CN Promozyme 200L  
CN Promozyme 460  
CN R-enzyme  
CN Starch debranching enzyme  
DR 9059-05-6  
MF Unspecified  
CI MAN  
LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA,  
CAPLUS, CASREACT, CBNB, CHEMCATS, CHEMLIST, CIN, CSCHEM, EMBASE, IFICDB,

IFIPAT, IFIUDB, PIRA, PROMT, TOXCENTER, USPAT2, USPATFULL  
Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

1057 REFERENCES IN FILE CA (1962 TO DATE)  
12 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
1058 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:270339  
REFERENCE 2: 138:267698  
REFERENCE 3: 138:237261  
REFERENCE 4: 138:237258  
REFERENCE 5: 138:169139  
REFERENCE 6: 138:133148  
REFERENCE 7: 138:105713  
REFERENCE 8: 138:85532  
REFERENCE 9: 138:75013  
REFERENCE 10: 138:75005

L50 ANSWER 3 OF 8 REGISTRY COPYRIGHT 2003 ACS

RN 9037-22-3 REGISTRY

CN Amylopectin (9CI) (CA INDEX NAME)

OTHER NAMES:

CN Amaizo 839  
CN Amioca  
CN Amioca WCS  
CN C\*Pharm 12018  
CN Cato 225  
CN Cato 240  
CN Cato 270  
CN Cérestar SF 04201  
CN Farinex WM 85  
CN Film Kote 54  
CN Honen Alpha Waxy Starch  
CN Kosol  
CN Pectin, amylo  
CN Starch, waxy  
CN Ultraamylopectin N  
CN Ultrasperse A  
CN Waxy 7350  
CN Waxy Alpha Y  
CN Waxy corn starch  
CN Waxy maize starch  
CN Waxy starch  
CN WCS

DR 9050-86-6, 189047-96-9

MF Unspecified

CI PMS, COM, MAN

PCT Manual registration, Polyother, Polyother only

LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CABA,  
CANCERLIT, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMLIST, CIN, CSCHEM,  
DDFU, DRUGU, EMBASE, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK\*,  
NAPRALERT, PIRA, PROMT, TOXCENTER, TULSA, USPAT2, USPATFULL

(\*File contains numerically searchable property data)  
Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

2780 REFERENCES IN FILE CA (1962 TO DATE)  
201 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
2785 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:276257

REFERENCE 2: 138:276256

REFERENCE 3: 138:276255

REFERENCE 4: 138:270689

REFERENCE 5: 138:270614

REFERENCE 6: 138:268469

REFERENCE 7: 138:268332

REFERENCE 8: 138:260453

REFERENCE 9: 138:254159

REFERENCE 10: 138:254154

L50 ANSWER 4 OF 8 REGISTRY COPYRIGHT 2003 ACS

RN 9030-10-8 REGISTRY

CN Glucosyltransferase, adenosine diphosphoglucose-starch (9CI) (CA INDEX NAME)

OTHER NAMES:

CN Adenosine diphosphate glucose-starch glucosyltransferase

CN Adenosine diphosphoglucose-starch glucosyltransferase

CN ADP-glucose starch synthase

CN ADP-glucose transglucosylase

CN ADP-glucose-starch glucosyltransferase

CN E.C. 2.4.1.21

CN Starch (bacterial glycogen) synthase

CN Starch synthase

CN Starch synthetase

MF Unspecified

CI MAN

LC STN Files: AGRICOLA, BIOBUSINESS, BIOSIS, CA, CAPLUS, CEN, CIN, NAPRALERT, PROMT, TOXCENTER, USPATFULL

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

487 REFERENCES IN FILE CA (1962 TO DATE)  
4 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
488 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:268499

REFERENCE 2: 138:251535

REFERENCE 3: 138:249919

REFERENCE 4: 138:239617

REFERENCE 5: 138:218282

REFERENCE 6: 138:184101  
REFERENCE 7: 138:133909  
REFERENCE 8: 138:105934  
REFERENCE 9: 138:101981  
REFERENCE 10: 138:50806

L50 ANSWER 5 OF 8 REGISTRY COPYRIGHT 2003 ACS

RN 9012-72-0 REGISTRY

CN D-Glucan (9CI) (CA INDEX NAME)

OTHER NAMES:

CN D-Glucosan

CN Glucan

CN Glucosan

CN Poly-D-glucan

CN Polyglucan

CN Polyglucosan

DR 9037-91-6, 9072-21-3

MF Unspecified

CI PMS, COM, MAN

PCT Manual registration

LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO,  
CA, CANCERLIT, CAPLUS, CHEMCATS, CHEMLIST, CIN, CSCHEM, DDFU, DRUGU,  
EMBASE, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, NAPRALERT, NIOSHTIC, PIRA,  
PROMT, RTECS\*, TOXCENTER, USPAT2, USPATFULL

(\*File contains numerically searchable property data)

Other Sources: EINECS\*\*, NDSL\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

1965 REFERENCES IN FILE CA (1962 TO DATE)

142 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

1967 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:250539  
REFERENCE 2: 138:226465  
REFERENCE 3: 138:217454  
REFERENCE 4: 138:206663  
REFERENCE 5: 138:200967  
REFERENCE 6: 138:172320  
REFERENCE 7: 138:168888  
REFERENCE 8: 138:152584  
REFERENCE 9: 138:138969  
REFERENCE 10: 138:126955

L50 ANSWER 6 OF 8 REGISTRY COPYRIGHT 2003 ACS

RN 9005-82-7 REGISTRY

CN Amylose (8CI, 9CI) (CA INDEX NAME)

OTHER NAMES:

CN .alpha.-Amylose

CN Amylose EX 1

CN AS 10  
CN AS 110  
CN AS 30  
CN AS 30 (carbohydrate)  
CN AS 320  
CN AS 5  
CN AS 70  
CN EX-I  
CN Polyamylose  
CN San Super 240L  
CN V Amylose  
DR 9051-21-2, 9060-22-4, 37243-82-6  
MF Unspecified  
CI PMS, COM, MAN  
PCT Manual registration, Polyother, Polyother only  
LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CABA,  
CANCERLIT, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMLIST, CIN, CSCHEM,  
DIOGENES, EMBASE, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MSDS-OHS,  
NAPRALERT, PIRA, PROMT, TOXCENTER, USPAT2, USPATFULL, VTB  
Other Sources: EINECS\*\*, NDSL\*\*, TSCA\*\*  
(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

4682 REFERENCES IN FILE CA (1962 TO DATE)

447 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

4687 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:276329  
REFERENCE 2: 138:276257  
REFERENCE 3: 138:276256  
REFERENCE 4: 138:276255  
REFERENCE 5: 138:270614  
REFERENCE 6: 138:270505  
REFERENCE 7: 138:254160  
REFERENCE 8: 138:254138  
REFERENCE 9: 138:251496  
REFERENCE 10: 138:251081

L50 ANSWER 7 OF 8 REGISTRY COPYRIGHT 2003 ACS

RN 9005-25-8 REGISTRY

CN Starch (8CI, 9CI) (CA INDEX NAME)

OTHER NAMES:

CN .alpha.-Starch  
CN Absorbo HP  
CN Ace P 320  
CN Actobody TP 2  
CN Aeromyl 115  
CN Agglofroid 009  
CN Agglofroid 313E  
CN Allbond 200  
CN Alphajel KS 37  
CN Alstar B  
CN Amaizo 100  
CN Amaizo 213



CN Amaizo 310  
CN Amaizo 5  
CN Amaizo 71  
CN Amaizo 710  
CN Amaizo W 13  
CN Amalean I-A 2131  
CN Amalean I-A 7081  
CN Amicoa  
CN Amidex 3005  
CN Amidex 4001  
CN Amido-STA 1500  
CN Amigel  
CN Amigel 12014  
CN Amigel 30076  
CN Amijel VA 160  
CN Amilys 100  
CN Amycol HF  
CN Amycol W  
CN Amylogum  
CN Amylomaize starch  
CN Amylomaize VII  
CN Amylon 70  
CN Amylose, mixt. with amylopectin  
CN Amylox 1  
CN Amylum  
CN Amyren 14  
CN Amyren 71  
CN Amysil K  
CN Amyzet TK  
CN Argo Corn Starch  
CN Arrowroot starch  
CN AS 225  
CN AS 225 (starch)  
CN Atomyl  
CN Aytex P  
CN B 200  
CN B 200 (polysaccharide)  
CN Bakeup YT 10

ADDITIONAL NAMES NOT AVAILABLE IN THIS FORMAT - Use FCN, FIDE, or ALL for  
DISPLAY

DEF A high-polymeric carbohydrate material primarily composed of amylopectin  
and amylose. It is usually derived from cereal grains such as corn, wheat  
and sorghum, and from roots and tubers such as potatoes and tapioca. It  
includes starch which has been pregelatinized by heating in the presence  
of water.

DR 9057-05-0, 53262-79-6, 131800-97-0, 60496-95-9, 67674-80-0, 75138-75-9,  
75398-82-2, 154636-77-8, 152987-55-8, 85746-25-4, 42616-76-2, 53112-52-0

MF Unspecified

CI COM, MAN

LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, AQUIRE, BIOBUSINESS, BIOSIS,  
BIOTECHNO, CA, CABA, CANCERLIT, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS,  
CHEMLIST, CIN, CSCHEM, CSNB, DDFU, DRUGU, EMBASE, IFICDB, IFIPAT,  
IFIUDB, IPA, MEDLINE, MSDS-OHS, NAPRALERT, NIOSHTIC, PDLCOM\*, PIRA,  
PROMT, RTECS\*, TOXCENTER, USAN, USPAT2, USPATFULL, VTB  
(\*File contains numerically searchable property data)  
Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

56877 REFERENCES IN FILE CA (1962 TO DATE)

6140 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

56940 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:276329  
REFERENCE 2: 138:276312  
REFERENCE 3: 138:276304  
REFERENCE 4: 138:276280  
REFERENCE 5: 138:276277  
REFERENCE 6: 138:276262  
REFERENCE 7: 138:276257  
REFERENCE 8: 138:276256  
REFERENCE 9: 138:276255  
REFERENCE 10: 138:276237

L50 ANSWER 8 OF 8 REGISTRY COPYRIGHT 2003 ACS

RN 9001-97-2 REGISTRY

CN Glycosyltransferase, .alpha.-glucan-branching (9CI) (CA INDEX NAME)

OTHER NAMES:

CN .alpha.-Glucan-branching glycosyltransferase

CN 1,4-.alpha.-Glucan branching enzyme

CN Amylose isomerase

CN Branching enzyme

CN Branching factor, enzymic

CN Branching glycosyltransferase

CN E.C. 2.4.1.18

CN Enzyme Q

CN Glucosan transglycosylase

CN Glycogen branching enzyme

CN Plant branching enzyme

CN Q-Enzyme

CN Starch-branching enzyme

MF Unspecified

CI MAN

LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA,  
CAPLUS, CEN, CHEMINFORMRX, CIN, EMBASE, MRCK\*, PIRA, TOXCENTER, USPAT2,  
USPATFULL

(\*File contains numerically searchable property data)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

497 REFERENCES IN FILE CA (1962 TO DATE)

2 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

500 REFERENCES IN FILE CAPLUS (1962 TO DATE)

REFERENCE 1: 138:268499  
REFERENCE 2: 138:251535  
REFERENCE 3: 138:249919  
REFERENCE 4: 138:185347  
REFERENCE 5: 138:182934  
REFERENCE 6: 138:150018  
REFERENCE 7: 138:135195

REFERENCE 8: 138:118540  
REFERENCE 9: 138:118539  
REFERENCE 10: 138:102870

=> fil wpix  
FILE 'WPIX' ENTERED AT 11:20:50 ON 25 APR 2003  
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FILE LAST UPDATED: 10 APR 2003 <20030410/UP>  
MOST RECENT DERWENT UPDATE: 200324 <200324/DW>  
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

Due to data production problems the WPI file had  
to be reset to update 200324.  
SDIs for update 24 will be rerun.  
The previous SDI run for 24 has been credited.  
Also answer sets created after April 10 may at least  
temporarily be affected and hence partially invalid.

>>> NEW WEEKLY SDI FREQUENCY AVAILABLE --> see NEWS <<<  
  
>>> SLART (Simultaneous Left and Right Truncation) is now  
available in the /ABEX field. An additional search field  
/BIX is also provided which comprises both /BI and /ABEX <<<  
  
>>> PATENT IMAGES AVAILABLE FOR PRINT AND DISPLAY <<<  
  
>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES,  
SEE <http://www.derwent.com/dwpi/updates/dwpcov/index.html> <<<  
  
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[http://www.stn-international.de/training\\_center/patents/stn\\_guide.pdf](http://www.stn-international.de/training_center/patents/stn_guide.pdf) <<<  
  
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GUIDES, PLEASE VISIT:  
[http://www.derwent.com/userguides/dwpi\\_guide.html](http://www.derwent.com/userguides/dwpi_guide.html) <<<  
  
=> d all abeq tech abex tot 178

L78 ANSWER 1 OF 18 WPIX (C) 2003 THOMSON DERWENT  
AN 2002-579390 [62] WPIX  
DNC C2002-163914  
TI **Freeze thawing** solution separation method for  
foodstuff solution, involves carrying out change of concentration of  
stratified formation ice, by physical effect of gravity, centrifugal force  
or pressing.  
DC D13 D17  
PA (KANS-N) KANSHO RIYO GIJUTSU KENKYUSHO KK  
CYC 1  
PI JP 2002153859 A 20020528 (200262)\* 9p C02F001-22  
ADT JP 2002153859 A JP 2000-352161 20001120  
PRAI JP 2000-352161 20001120  
IC ICM C02F001-22  
ICS B01J019-00; C02F011-20  
ICA A23L003-365  
AB JP2002153859 A UPAB: 20020926  
NOVELTY - A stratified formation ice has a gradient property in solute  
concentration obtained by advanced **freezing** of original  
solution. The change in concentration of stratified formation ice is done

by physical effect of gravity, centrifugal force or pressing to reduce the solute concentration of residual ice. The separation process is divided to multistage separation of fusion liquid.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) Solid liquid separation method which involves **freezing** of suspension solution of suspended solid, by advanced **freezing** process. The fused fusion solution is filtered by the filter medium; and

(2) **Freeze thawing** separation apparatus includes stock solution filled for concentration. The erection inner tube (11) takes the ice in circulating state from the lower portion. The condensed portion consists of outer tube (12) forming concentration stock solution in an inner tube inducing advance **freezing**. A stock solution tank, concentration liquid feed zone and vertical double pipe-type concentrator (10) are provided in the apparatus. The erection tube is cooled by the coolant for **freezing**, and fusion container with filter medium is provided from advance **freezing** condensation portion.

USE - The **freeze thawing** solution is used for foodstuff and pharmaceutical using a **freezing** and **thawing** method, such as for root vegetable and corns, sweet potato in the food industry.

ADVANTAGE - This method promotes zero emission effectively and improves concentration efficiency and **freezing** efficiency. It also reduces the cost of waste liquid disposal and effective usage of resources.

DESCRIPTION OF DRAWING(S) - The figure shows the outline **freeze thawing** separation apparatus. (Drawing includes non-English language text).

Concentrator 10

Inner tube 11

Outer tube 12

Dwg.1/8

FS

CPI

FA

AB; GI

MC

CPI: D03-H02A; D06-H01

L78 ANSWER 2 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 2002-395367 [43] WPIX

DNC C2002-111427

TI Process for preparing **starch** product with high resistance to enzymolysis.

DC All

IN CHEN, L; WEN, Q

PA (UYHU-N) UNIV HUANAN SCI & ENG

CYC 1

PI CN 1334273 A 20020206 (200243)\*

C08B030-00

<--

ADT CN 1334273 A CN 2001-127741 20010816

PRAI CN 2001-127741 20010816

IC ICM C08B030-00

ICS A23L001-0522

AB CN 1334273 A UPAB: 20020709

NOVELTY - A **starch** product with high resistance to enzymolysis is prepared from beans, grains, **potato starch**, or higher straight-chain corn **starch** through mixing **starch** with water, stirring, regulating pH value, spray heating for gelation, maintaining a certain temperature for a certain time, loading in reactor, cooling, regulating pH value again, adding pullulan enzyme, cutting reaction, microwave heating, condensing, **freezing**, **thawing**, flocculating, and suction filtering or centrifugal filtering. Its advantages are widely available raw materials, low cost, simple process and high content of the **starch** with high resistance to enzymolysis.

Dwg.0/0  
 FS CPI  
 FA AB  
 MC CPI: A03-A; A10-G01B

L78 ANSWER 3 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 2001-257879 [26] WPIX

DNC C2001-077719

TI **Potato starch** stable against **freeze-thaw** cycles in native form, useful e.g. as thickener for foods, produced from transgenic plants in which **starch** synthase enzymes are inhibited.

DC C06 D16 D17

IN **JOBLING, S A; SCHWALL, G P; WESTCOTT, R J**

PA (NATT) NAT STARCH & CHEM INVESTMENT HOLDING COR

CYC 95

PI WO 2001019975 A2 20010322 (200126)\* EN 76p C12N015-00 <--  
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
 NL OA PT SD SE SL SZ TZ UG ZW  
 W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM  
 DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC  
 LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE  
 SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW  
 AU 2000070310 A 20010417 (200140) C12N015-00 <--  
 EP 1212440 A2 20020612 (200239) EN C12N015-82 <--  
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
 RO SE SI

JP 2003509047 W 20030311 (200319) 122p C12N015-09 <--  
 ADT WO 2001019975 A2 **WO 2000-GB3522 20000913**; AU 2000070310 A AU  
 2000-70310 20000913; EP 1212440 A2 EP 2000-958901 20000913, **WO**  
**2000-GB3522 20000913**; JP 2003509047 W **WO 2000-GB3522 20000913**  
 , JP 2001-523747 20000913

FDT AU 2000070310 A Based on WO 200119975; EP 1212440 A2 Based on WO  
 200119975; JP 2003509047 W Based on WO 200119975

PRAI **GB 1999-21830 19990915**

IC ICM C12N015-00; C12N015-09; C12N015-82  
 ICS A01H005-00; A23L001-05; C08B030-00; C08B030-02;  
 C08B030-12; C12N005-10; C12N009-10

AB WO 200119975 A UPAB: 20010515

NOVELTY - **Potato starch** (I), in native form as extracted, has **freeze-thaw** stability such that a 1 %weight/volume aqueous suspension has an absorbance at 700 nm less than 1.2 unit after 4 cycles of **freezing** overnight at -70 deg. C and **thawing** at room temperature for 2 hr, and 0.9, 0.7 or 0.5 units after, respectively, 3, 2 and 1 such cycles.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) plant cell containing nucleic acid sequences (I) that specifically inhibit granule-bound **starch** synthase I (GBSSI) and at least one other enzyme involved in **starch** synthesis;

(b) plant cell containing (I) that specifically inhibit expression of 3 or more enzymes involved in **starch** synthesis;

(c) plants, or their progeny, containing (I), that specifically inhibit granule-bound **starch** synthase I (GBSSI) and at least one other enzyme involved in **starch** synthesis;

(d) method (M1) of altering the **starch** composition of plants by introducing (I) that specifically inhibit granule-bound **starch** synthase I (GBSSI) and at least one other enzyme involved in **starch** synthesis;

(e) plants produced by (M1);

(f) **starch** produced by plants (produced by M1); and

(g) generally any **potato starch** that, in native form as extracted, has **freeze-thaw** stability.

USE - (I) is used in preparation of thickener compositions (for food or industrial use); packaging; adhesives; paper; coatings and personal care products (claimed).

ADVANTAGE - (I) has excellent **freeze-thaw** stability, without requiring expensive in vitro modification, permitting long-term storage of products containing it at low temperatures.

Dwg.0/22

FS CPI

FA AB; DCN

MC CPI: **C04-C02B**; C04-E02; C04-E06; C04-F0800E; C04-L08; C04-M01;  
D05-C03G; **D05-H14B3**; **D05-H16B**; **D06-H01**

TECH UPTX: 20010515

TECHNOLOGY FOCUS - BIOLOGY - Preferred **starch**: (I) is also characterized by:

(1) **freeze-thaw** stability such that a 5 %weight/volume (% w/v) aqueous paste shows less than 40 (especially 10)% syneresis after 4 cycles of **freezing** at -70 degrees Celsius overnight, **thawing** at 22 degrees Celsius for 60 min, then centrifuging at 8000 g for 10 min at 18 degrees Celsius, or less than 30 (especially 10)% syneresis after 3 or 2 such cycles; (I) also has the same syneresis properties for a **freeze-thaw** cycle of 1 hr at -70 degrees Celsius and 10 min at 22 degrees Celsius, with centrifuging;  
(2) an apparent amylose content less than 8%, and ratio of fraction I: fraction II short chain glucans of at least 60, preferably 70,%; optionally also a viscosity onset temperature below 67 degrees Celsius (best 51 degrees Celsius) (as determined by viscometric analysis of a 7.4% w/v aqueous suspension, using a Rapid Visco Amylograph, Newport Scientific instrument operated on the standard 1 heating and stirring protocol) and a gelation onset temperature below 67 degrees Celsius (best 50 degrees Celsius), when analyzed on a Perkin-Elmer DSC (differential scanning calorimeter) 7, using a 10 mg sample in an aqueous mixture of less than 25 % w/v **starch** content. After extraction, (I) may be modified by physical, chemical and/or enzymatic processes.

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred plants: In the cells, at least one of **starch** synthase (SS) II and/or III is inhibited, particularly by expressing the appropriate antisense sequence or by sense suppression methods. The transformed cells are regenerated to plants conventionally. The cells are particularly from **potato** but may also be from rice, cassava or maize.

ABEX UPTX: 20010515

EXAMPLE - The full-length cDNA for **potato** granule bound **starch** synthase I (GBSSI) was cloned into the plant transformation vector pGPTV-HYG to form pSJ152, containing the GBSSI sequence in the opposite orientation with respect to a double 35S promoter. This vector was used, via *Agrobacterium tumefaciens* LBA4404, to transform **potato** explants (**microtubers** or leaf fragments) from the transgenic line 17.29 (Plant J., 17 (1999) 251) in which inhibition of the **starch** synthase (SSI) I and II enzymes was almost complete. The explants were regenerated conventionally. Two transgenic lines showed almost complete absence of GBSSI, and one of these lines (1829) produced a **starch** of only 2.67% amylose content, with Rapid Visco Amylograph onset and peak temperatures of 50.3 and 70.2 degrees Celsius, and differential scanning calorimetry onset and peak temperatures 48.6 and 53.2 degrees Celsius. When the **starch** was subjected to **freeze-thaw** cycles, its absorbance at 700 nm reached 1 unit only after 9-10 cycles, compared with an absorbance of 1.4 unit after a single cycle for wild-type **starch**.

L78 ANSWER 4 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 2001-236028 [25] WPIX

DNC C2001-071063

TI New nucleic acid encoding a **starch** synthase isoform from maize,

used to produce recombinant plants that produce **starch** with modified properties.

DC C06 D16 P13  
 IN FROHBERG, C  
 PA (AVET) AVENTIS CROPS SCIENCE GMBH  
 CYC 94  
 PI DE 19937348 A1 20010222 (200125)\* 32p C12N009-00 <--  
 WO 2001012826 A2 20010222 (200125) DE C12N015-82 <--  
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
 NL OA PT SD SE SL SZ TZ UG ZW  
 W: AE AG AL AM AU AZ BA BB BG BR BY BZ CA CN CR CU CZ DM DZ EE GD GE  
 HR HU ID IL IN IS JP KG KP KR KZ LC LK LR LT LV MA MD MG MK MN MX  
 NO NZ PL RO RU SG SI SK TJ TM TR TT UA UZ VN YU ZA  
 AU 2000069937 A 20010313 (200134) C12N015-82 <--  
 BR 2000013115 A 20020423 (200235) C12N015-82 <--  
 EP 1200615 A2 20020502 (200236) DE C12N015-82 <--  
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
 RO SE SI  
 CN 1378600 A 20021106 (200316) C12N015-82 <--  
 JP 2003507020 W 20030225 (200317) 104p C12N015-09 <--  
 ADT DE 19937348 A1 DE 1999-19937348 19990811; WO 2001012826 A2 WO 2000-EP7673  
 20000808; AU 2000069937 A AU 2000-69937 20000808; BR 2000013115 A BR  
 2000-13115 20000808, WO 2000-EP7673 20000808; EP 1200615 A2 EP 2000-958396  
 20000808, WO 2000-EP7673 20000808; CN 1378600 A CN 2000-809585 20000808;  
 JP 2003507020 W WO 2000-EP7673 20000808, JP 2001-516913 20000808  
 FDT AU 2000069937 A Based on WO 200112826; BR 2000013115 A Based on WO  
 200112826; EP 1200615 A2 Based on WO 200112826; JP 2003507020 W Based on  
 WO 200112826  
 PRAI DE 1999-19937348 19990811  
 IC ICM C12N009-00; C12N015-09; C12N015-82  
 ICS A01H005-00; A23L001-05; A23L001-052; A23L001-0522; C08B031-00;  
 C12N005-10; C12N009-10; C12N015-29;  
 C12P019-04  
 ICI C12N005-10; C12P019-04; C12R001:91; C12R001:91  
 AB DE 19937348 A UPAB: 20010508  
 NOVELTY - Nucleic acid (I) encoding a protein (II), or its active  
 fragments, with **starch** synthase (SS) activity encoding a 1170  
 residue amino acid sequence (S2), comprising a 4121 base pair sequence  
 (S1), both fully defined in the specification, or its complement, or  
 containing the coding region of the cDNA insert in plasmid IR65/87 (DSM  
 12970) or its complement, is new.  
 DETAILED DESCRIPTION - Nucleic acid (I) encoding a protein (II), or  
 its active fragments, with **starch** synthase (SS) activity  
 encoding a 1170 residue amino acid sequence (S2), comprising a 4121 base  
 pair sequence (S1), both fully defined in the specification, or its  
 complement, or containing the coding region of the cDNA insert in plasmid  
 IR65/87 (DSM 12970) or its complement, is new. (I) may be equivalent to  
 the sequences within the degeneracy of the genetic code, or a fragment,  
 allelic variant and/or derivative of them.  
 INDEPENDENT CLAIMS are also included for the following:  
 (1) vector containing (I);  
 (2) host cell, or transgenic plant cell, that contains (I) or the  
 vector of (1), or is derived from such a cell;  
 (3) (II), or its active fragments, encoded by (I);  
 (4) production of (II), or its active fragments, by culturing cells  
 of (2);  
 (5) plant containing transgenic cells of (2), and their replicative  
 material;  
 (6) production of the plants of (5);  
 (7) **starch** produced by the plant cells of (2) or the plants  
 of (5), or their replicative material; and  
 (8) production of modified **starch** by extraction from the  
 plant cells of (2) or the plants of (5), or their **starch**-storing

parts.

USE - (I) is used to prepare transgenic plants (specifically maize) that have reduced or increased SS activity, resulting in formation of **starch** with different chemical and/or physical, and functional, properties, particularly altered viscosity and gel-forming properties. Fragments of (I) can also be used as probes to isolate related sequences from other organisms, also as antisense inhibitors of SS activity. The **starch** produced by the transgenic plants is useful for all usual nutritional and non-nutritional applications.

ADVANTAGE - Modified **starch** may be better suited to particular applications.

Dwg.0/1

FS CPI GMPI

FA AB; DCN

MC CPI: C04-A0800E; **C04-C02B2**; C04-E02; C04-E02E; C04-E02F; C04-E03; C04-E03E; C04-E03F; C04-E04; C04-E06; C04-E08; C04-F0100E; C04-F0800E; C04-L04; C04-L08; C11-A; D05-C03E; D05-C08; D05-H09; D05-H12A; D05-H12D1; D05-H12D2; D05-H12E; **D05-H14B3**; **D05-H16B**; D05-H17A3

TECH UPTX: 20010508

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Nucleic Acid: (I) may be RNA or DNA and represents a new isoform of maize SS.

Preferred Vectors: The vectors contain regulatory elements that allow transcription and/or synthesis of translatable RNA in prokaryotes and/or eukaryotes. (I) may be in the antisense orientation with respect to the regulatory elements so that SS activity is reduced. This reduction may also be achieved by expressing a ribozyme, co-suppression or by in vivo mutagenesis. Particularly (I) is under control of an endosperm-specific promoter, e.g. the shrunken-1 promoter of maize.

Preferred Plants: The plants have reduced or increased activity of (II) relative to wild-type plants. They are particularly **starch**-storing plants, specifically maize, and are produced by conventional genetic modification of cells with (I) then regeneration.

Preparation: A cDNA library from maize was screened with the cDNA sequence encoding **potato** SSIII to isolate plasmid pZmSS6. The NotI-BspI20 fragment of this vector, containing the complete coding sequence (S1), was used to produce the vector IR65/87 (DSM 12970). This vector was used to transform maize protoplasts and these were regenerated by standard methods.

TECHNOLOGY FOCUS - BIOLOGY - Preferred **Starch**: The modified **starch** produced by the transgenic plants may have alterations in amylose/amylopectin ratio, degree of branching, mean chain length, phosphate content; pasting properties, grain size and/or grain morphology, resulting in altered functional properties such as retrogradation, film-formation, gel strength, viscosity, color stability, enzymatic digestion, **freeze-thaw** stability, shear stability, transparency, water-binding, and pasting, binding or adhesion properties.

L78 ANSWER 5 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 2001-042604 [06] WPIX

DNC C2001-012424

TI Soluble branched glucose polymers with stable low viscosities useful in food compositions, e.g. as binders in instant liquid products.

DC A11 D16

IN BACKER, D; CABOCHE, J J; COMINI, S; FLECHE, G; LOOTEN, P; PETITJEAN, C; CABOCHE, J

PA (ROQF) ROQUETTE FRERES SA

CYC 93

PI FR 2792941 A1 20001103 (200106)\* 28p C08B037-00

WO 2000066633 A1 20001109 (200106) FR C08B030-12 <--

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
OA PT SD SE SL SZ TZ UG ZW



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 EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK  
 LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI  
 SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU 2000043052 A 20001117 (200111) C08B030-12 <--  
 EP 1177216 A1 20020206 (200218) FR C08B030-12 <--

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
 RO SE SI

NO 2001005224 A 20011025 (200221) C08B030-12 <--  
 KR 2002010622 A 20020204 (200254) C08B030-12 <--  
 CN 1349544 A 20020515 (200260) C08B030-12 <--  
 JP 2002543248 W 20021217 (200312) 26p C08B031-00

ADT FR 2792941 A1 FR 1999-5523 19990430; WO 2000066633 A1 WO 2000-FR1109  
 20000426; AU 2000043052 A AU 2000-43052 20000426; EP 1177216 A1 EP  
 2000-922758 20000426, WO 2000-FR1109 20000426; NO 2001005224 A WO  
 2000-FR1109 20000426, NO 2001-5224 20011025; KR 2002010622 A KR  
 2001-713894 20011030; CN 1349544 A CN 2000-806938 20000426; JP 2002543248  
 W JP 2000-615661 20000426, WO 2000-FR1109 20000426

FDT AU 2000043052 A Based on WO 200066633; EP 1177216 A1 Based on WO  
 200066633; JP 2002543248 W Based on WO 200066633

PRAI FR 1999-5523 19990430

IC ICM C08B030-12; C08B031-00; C08B037-00

ICS A23L001-09; C12N009-10; C12P019-04; C12P019-16

ICI C12N009-10, C12R001:89

AB FR 2792941 A UPAB: 20010126

NOVELTY - Soluble branched glucose polymers (I) with no beta -glucoside linkages, 4-6.5% alpha -1,6-glucoside linkages, little or no tendency to undergo retrogradation in aqueous solution, a viscosity of 200-5000 cP and a molecular weight of 100,000-500000000, are new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) production (II) of (I) by heating an aqueous suspension containing at least 2 (preferably 2-5) % by weight (wt.%) **starch** or a **starch** derivative at a temperature above 130 deg. C (preferably 140-150 deg. C) and a pressure above 3.5 bar (preferably 4-5 bar) for at least 2 minutes (preferably 2-5 minutes) and treating the product with 500-2000 units of a purified branching enzyme at 25-40 deg. C (preferably 30 deg. C) for 10 minutes to 20 hours; and

(2) compositions containing (I) for use in the food industry.

USE - (I) are useful in food compositions, e.g. as binders in instant liquid products, including refrigerated and **frozen** products.

ADVANTAGE - Aqueous solutions of (I) have a stable low viscosity and good **freeze-thaw** stability.

Dwg.0/0

FS CPI

FA AB

MC CPI: A03-A00A; A10-E; A12-W09; D03-H01Q; D03-H01R; D05-A02; D05-A04;  
 D05-C08; D05-H08

TECH UPTX: 20010126

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Branching Enzyme: This is a glycogen or **starch** branching enzyme derived from a plant, yeast, bacterium or unicellular alga, especially a genetically modified unicellular alga.

Preparation: (I) is prepared by (II).

ABEX UPTX: 20010126

EXAMPLE - A 2.5% suspension of waxy maize **starch** was heated at 145 degreesC and 4 bar in a tubular cooker with a residence time of 3 minutes. The product (1500 ml) was cooled to room temperature, diluted to 3750 ml with 0.1 M Tris-HCl buffer (pH 7), treated with a solution of recombinant *Clamydomonas reinhardtii* **starch** branching enzymes (19 ml, 1100 U/mg), and incubated at 30degreesC for 30 minutes. The product was precipitated with ethanol, filtered, washed and dried to give a polymer containing 4.3% alpha-1,6-glucoside linkages.

L78 ANSWER 6 OF 18 WPIX (C) 2003 THOMSON DERWENT  
 AN 2000-400088 [34] WPIX  
 DNN N2000-299675 DNC C2000-120880  
 TI Transgenic wheat or maize plants with altered **starch**  
 synthesizing ability, useful for producing **starch** with altered  
 properties that are beneficial in terms of **starch** processing.  
 DC C06 D16 P13  
 IN BURRELL, M M  
 PA (ADTE-N) ADVANCED TECHNOLOGIES CAMBRIDGE LTD; (ADTE-N) ADVANCED  
 TECHNOLOGIES CAMBRIDGE  
 CYC 87  
 PI WO 2000031282 A1 20000602 (200034)\* EN 53p C12N015-82 <--  
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
 OA PT SD SE SL SZ TZ UG ZW  
 W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES  
 FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU  
 LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM  
 TR TT UA UG UZ VN YU ZA ZW  
 AU 2000011690 A 20000613 (200043) C12N015-82 <--  
 ADT WO 2000031282 A1 WO 1999-GB3762 19991108; AU 2000011690 A AU 2000-11690  
 19991108  
 FDT AU 2000011690 A Based on WO 200031282  
 PRAI GB 1998-25262 19981119  
 IC ICM C12N015-82  
 ICS A01H005-00; C08B030-00; C12N015-54  
 AB WO 200031282 A UPAB: 20000718

NOVELTY - New transgenic wheat or maize plants (I) with altered  
**starch** synthesizing ability, comprise a chimeric gene having a  
 promoter, a coding sequence for glycogen branching enzyme and a  
 terminator.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the  
 following:

(1) a method of altering the **starch** in maize or wheat  
 plants, comprises stably introducing into the plant genome a chimeric gene  
 comprising a nucleic acid sequence encoding glycogen branching enzyme  
 under the direction of a suitable promoter and a suitable terminator, and  
 regenerating a plant having an altered genome;

(2) **starch** obtained from wheat or maize transformed by the  
 method of (1), where the **starch** has an altered chain length  
 and/or processing property compared with control **starch** from a  
 non-transformed plant;

(3) seed of (I);

(4) maize or wheat plant cells containing a chimeric gene comprising  
 a promoter, a coding sequence for glycogen branching enzyme, and a  
 terminator;

(5) maize or wheat plant cells transformed by the method of (1) and  
 containing **starch** having a decrease chain length;

(6) a construct defined in the specification and deposited under  
 NCIMB Accession No. 40982; and

(7) a construct comprising a promoter-gene fragment-terminator  
 cassette comprising a transit peptide and a coding sequence for glycogen  
 branching enzyme.

USE - The transgenic wheat or maize plants are useful for producing  
**starch** with altered properties that are beneficial in terms of  
**starch** processing, for e.g. the **freeze-thaw**  
 stability of the **starch** is improved.

The **starch** produced can be used as food in animal diets.  
 The **starch** is also useful in the industrial production of paper,  
 textiles, plastic and adhesives.

ADVANTAGE - The **freeze-thaw** stability of the  
**starch** is improved (claimed).

Dwg.0/12

FS CPI GMPI  
 FA AB; DCN  
 MC CPI: C04-A08C2E; C04-A09F; **C04-C02B**; C04-E08; C04-F0800E;  
 D05-H12E; **D05-H14B3**; **D05-H16B**

TECH UPTX: 20000718

TECHNOLOGY FOCUS - AGRICULTURE - Preferred Method: In the method of (1), the nucleic acid sequence encoding glycogen branching enzyme is a sequence obtained from a unicellular organism, an alga or bacterium such as E. coli, Agrobacterium, Salmonella or Bacillus.

The promoter is capable of directing expression in a particular tissue of the plant and/or at particular stages of development of the plant. The promoter is heterologous or homologous with respect to the plant. The promoter directs expression to the endosperm of the seed. The promoter is the high molecular weight glutenin (HMWG) gene of wheat. Preferably, the promoter is one or more of the promoters of gliadin, branching enzyme, ADPG (undefined) pyrophosphorylase, **starch** synthase or actin.

The chimeric gene also contains a sequence that encodes a transit peptide which provides for translocation of the glycogen branching enzyme and/or a marker gene or other coding sequence to the plant plastid.

The transit peptide is one or more of the group consisting of the small subunit of the ribulose biphosphate carboxylase enzyme (ssu of Rubisco) from pea, maize or sunflower, the transit peptide for the plant plastid acyl carrier protein (ACP) or the transit peptide for **starch** granule bound synthase I (GBSSI).

The chimeric gene comprises one or more additional coding sequences from the **starch** or glycogen biosynthetic pathway. The additional coding sequence is the sequence of glycogen synthase (EC 2.4.1.21). The chimeric gene also comprises a gene switch mechanism which determines under what conditions or when the coding sequence is to be expressed. The gene switch is a chemically induced promoter or a temperature controlled promoter.

Preferred **Starch**: The chain length is decreased. The viscosity is increased, which affects the processing properties of the **starch**. The degree of retrogradation of the **starch** is lower, where the altered degree of retrogradation affects the processing properties of the **starch**.

ABEX UPTX: 20000718

EXAMPLE - Methods for the transformation of wheat by particle bombardment are well known in the art, for e.g. see Vasil et al., Bio/Technology, 667-674, (1992). Immature embryos of wheat were used to initiate embryogenic callus. The callus was subcultured and used for particle bombardment with gold particles coated with plasmid DNA.

Two plasmids were used per bombardment, one plasmid carried the construct of interest, in this case pDV03201 (comprising the glgB (coding sequence for E. coli glycogen branching enzyme) DNA). The second plasmid carried a selectable marker which expresses the gene responsible for resistance to the herbicide Basta. Plants resistant to Basta were generally found to also have the recombinant gene of interest present. Bombarded calli were grown on Basta selection media and surviving calli were transferred to regeneration medium. Rooted plants were transferred to soil and grown to maturity in a growth room. Primary transformant wheat plants (T0) were selfed to produce transgenic seed. Seed were extracted for protein and the protein analyzed by western blotting for the presence of E. coli glgB polypeptide.

L78 ANSWER 7 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 2000-400083 [34] WPIX

DNN N2000-299672 DNC C2000-120875

TI Transgenic wheat or maize plants with altered **starch** synthesizing ability, useful for producing **starch** with altered properties that are beneficial in terms of **starch** processing.

DC C06 D16 P13

IN BURRELL, M M

PA (ADTE-N) ADVANCED TECHNOLOGIES CAMBRIDGE LTD; (ADTE-N) ADVANCED TECHNOLOGIES CAMBRIDGE

CYC 89

PI WO 2000031274 A1 20000602 (200034)\* EN 63p C12N015-54 <--  
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
 OA PT SD SE SL SZ TZ UG ZW  
 W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES  
 FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU  
 LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM  
 TR TT UA UG UZ VN YU ZA ZW  
 AU 2000010616 A 20000613 (200043) C12N015-54 <--  
 EP 1131442 A1 20010912 (200155) EN C12N015-54 <--  
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
 RO SE SI  
 US 6468799 B1 20021022 (200273) C12N015-29 <--

ADT WO 2000031274 A1 WO 1999-GB3734 19991109; AU 2000010616 A AU 2000-10616  
 19991109; EP 1131442 A1 EP 1999-954197 19991109, WO 1999-GB3734 19991109;  
 US 6468799 B1 US 1999-444728 19991118

FDT AU 2000010616 A Based on WO 200031274; EP 1131442 A1 Based on WO 200031274

PRAI GB 1998-25242 19981119

IC ICM C12N015-29; C12N015-54  
 ICS A01H005-00; A23L001-0522; C08B030-00; C12N005-04;  
 C12N005-10; C12N015-82

AB WO 200031274 A UPAB: 20000718  
 NOVELTY - New transgenic wheat or maize plants (I) with altered  
**starch** synthesizing ability, comprise a chimeric gene having a  
 promoter, a coding sequence for glycogen synthase and a terminator.  
 DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the  
 following:  
 (1) a method of altering the **starch** in maize or wheat  
 plants, comprises stably introducing into the plant genome a chimeric gene  
 comprising a nucleic acid sequence encoding glycogen synthase under the  
 direction of a suitable promoter and a suitable terminator, and  
 regenerating a plant having an altered genome;  
 (2) **starch** obtained from wheat or maize transformed by the  
 method of (1), where the **starch** has an altered chain length  
 and/or processing property compared with control **starch** from a  
 non-transformed plant;  
 (3) maize or wheat plant cells containing a chimeric gene comprising  
 a promoter, a coding sequence for glycogen synthase, and a terminator;  
 (4) seed of (I);  
 (5) maize or wheat plant cells transformed by the method of (1) and  
 containing **starch** having a decrease chain length;  
 (6) a construct defined in the specification and deposited under  
 NCIMB Accession No. 40962; and  
 (7) a construct comprising a promoter-gene fragment-terminator  
 cassette comprising a transit peptide and a coding sequence for glycogen  
 synthase derived from a micro-organism.  
 USE - The transgenic wheat or maize plants are useful for producing  
**starch** with altered properties that are beneficial in terms of  
**starch** processing, for e.g. the **freeze-thaw**  
 stability of the **starch** is improved.  
 The **starch** produced can be used as food in animal diets.  
 The **starch** is also useful in the industrial production of paper,  
 textiles, plastic and adhesives.  
 ADVANTAGE - The **freeze-thaw** stability of the  
**starch** is improved (claimed).  
 Dwg.0/17

FS CPI GMPI

FA AB; DCN

MC CPI: C04-A08C2E; C04-A09F; C04-C02B; C04-E08; C04-F0800E;  
 D05-H12E; D05-H14B3; D05-H16B

TECH UPTX: 20000718

TECHNOLOGY FOCUS - AGRICULTURE - Preferred Method: In the method of (1), the nucleic acid sequence encoding glycogen synthase is a sequence obtained from a unicellular organism, an alga or bacterium such as E. coli, Agrobacterium, Salmonella or Bacillus.

The promoter is capable of directing expression in a particular tissue of the plant and/or at particular stages of development of the plant. The promoter is heterologous or homologous with respect to the plant. The promoter directs expression to the endosperm of the seed. The promoter is the high molecular weight glutenin (HMWG) gene of wheat. Preferably, the promoter is one or more of the promoters of gliadin, branching enzyme, ADPG (undefined) pyrophosphorylase, **starch** synthase or actin.

The chimeric gene also contains a sequence that encodes a transit peptide which provides for translocation of the glycogen synthase and/or a marker gene or other coding sequence to the plant plastid.

The transit peptide is one or more of the group consisting of the small subunit of the ribulose biphosphate carboxylase enzyme (ssu of Rubisco) from pea, maize or sunflower, the transit peptide for the plant plastid acyl carrier protein (ACP) or the transit peptide for **starch** granule bound synthase I (GBSSI).

The chimeric gene comprises one or more additional coding sequences from the **starch** or glycogen biosynthetic pathway. The additional coding sequence is the sequence of glycogen branching enzyme (EC 2.4.1.18). The chimeric gene also comprises a gene switch mechanism which determines under what conditions or when the coding sequence is to be expressed. The gene switch is a chemically induced promoter or a temperature controlled promoter.

Preferred **Starch**: The chain length is increased, preferably between 17 and 18 glucose units. The viscosity is decreased, which affects the processing properties of the **starch**. The degree of retrogradation of the **starch** is altered, where the altered degree of retrogradation affects the processing properties of the **starch**.

ABEX UPTX: 20000718

EXAMPLE - Methods for the transformation of wheat by particle bombardment are well known in the art, for e.g. see Vasil et al., Bio/Technology, 667-674, (1992). Immature embryos of wheat were used to initiate embryogenic callus. The callus was subcultured and used for particle bombardment with gold particles coated with plasmid DNA.

Two plasmids were used per bombardment, one plasmid carried the construct of interest, in this case pDV03191 (comprising the glgA (coding sequence for E. coli glycogen synthase) DNA). The second plasmid carried a selectable marker which expresses the gene responsible for resistance to the herbicide Basta. Plants resistant to Basta were generally found to also have the recombinant gene of interest present. Bombarded calli were grown on Basta selection media and surviving calli were transferred to regeneration medium. Rooted plants were transferred to soil and grown to maturity in a growth room. Primary transformant wheat plants (T0) were selfed to produce transgenic seed. Seed were extracted for protein and the protein analyzed by western blotting for the presence of E. coli glgA polypeptide.

L78 ANSWER 8 OF 18 WPIX (C) 2003 THOMSON DERWENT  
 AN 2000-126546 [11] WPIX  
 DNN N2000-095371 DNC C2000-038539  
 TI Altering characteristics of plants by inhibiting expression of **starch** synthase enzymes, used to produce modified **starch** with reduced viscosity onset temperature.  
 DC A11 A97 C06 D16 F06 F09 G03 P13  
 IN EDWARDS, E A; JOBLING, S A; MARTIN, C R; SCHWALL, G P; SMITH, A M; WESTCOTT, R J  
 PA (NATT) NAT STARCH & CHEM INVESTMENT HOLDING COR  
 CYC 87  
 PI WO 9966050 A1 19991223 (200011)\* EN 49p C12N015-54

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
 OA PT SD SE SL SZ UG ZW  
 W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB  
 GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU  
 LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR  
 TT UA UG US UZ VN YU ZA ZW

AU 9943802 A 20000105 (200024) C12N015-54

EP 1092033 A1 20010418 (200123) EN C12N015-54

R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

JP 2002518015 W 20020625 (200243) 55p C12N015-09

ADT WO 9966050 A1 WO 1999-GB1902 19990615; AU 9943802 A AU 1999-43802  
 19990615; EP 1092033 A1 EP 1999-926617 19990615, WO 1999-GB1902 19990615;  
 JP 2002518015 W WO 1999-GB1902 19990615, JP 2000-554859 19990615

FDT AU 9943802 A Based on WO 9966050; EP 1092033 A1 Based on WO 9966050; JP  
 2002518015 W Based on WO 9966050

PRAI EP 1998-304716 19980615

IC ICM C12N015-09; C12N015-54

ICS A01H005-00; A21D002-36; C08B030-04; C12N015-82

AB WO 9966050 A UPAB: 20000301

NOVELTY - One or more characteristics of a plant are modified by  
 introducing at least two sequences (I), or their fragments or functional  
 equivalents, each comprising a gene that encodes an enzyme (II) with  
**starch** synthase activity. Each (I) is linked to a promoter and is  
 able to affect expression of the corresponding endogenous gene.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the  
 following:

- (a) plants modified this way and their progeny or parts;
- (b) **starch** obtained from the plants of (a);
- (c) **starch** obtained from potato and having
  - (i) viscosity onset temperature less than 55 deg. C (measured at  
 atmospheric pressure on a 10wt.% aqueous suspension in a Newport  
 Scientific Rapid Visco Analyser (viscoamylograph)) or
  - (ii) endosperm onset temperature less than 50 deg. C (measured by  
 differential scanning calorimetry on a Perkin-Elmer DSC7);
- (d) production of **starch** by extracting plants of (a);
- (e) nucleic acid construct (A) containing at least two (I), operably  
 linked to a promoter; and (f) plants, or their parts or progeny,  
 containing (A).

ACTIVITY - None given.

MECHANISM OF ACTION - Altering activity of **starch** synthesis  
 enzymes, by sense or antisense suppression of endogenous genes.

USE - The modified plants are used to produce **starch** for  
 use in production or processing of foods, paper, textiles and adhesives  
 (claimed).

ADVANTAGE - **Starch** produced by the transgenic plants has a  
 lower viscosity onset temperature, so requires milder processing  
 conditions (reduced energy demand) and, in foods, imparts better quality  
 and color with reduced off-flavors or volatiles.

Dwg.0/14

FS CPI GMPI

FA AB; DCN

MC CPI: A03-A; A10-A; C04-A0800E; C04-C02B; C04-E02; D05-C08;  
 D05-H08; D05-H12E; D05-H16B; D05-H18; F05-A06B; G03-B02A

TECH UPTX: 20000301

TECHNOLOGY FOCUS - BIOLOGY - Preferred **Starch**: This has

- (i) viscosity onset temperature (measured as above) at least 10,  
 preferably 12, degreesC lower than that of **starch** from unmodified  
 plants;
- (ii) endosperm onset temperature (measured as above) at least 15,  
 especially 17, degreesC lower (best less than 44 degreesC) and (iii)  
 contains more modules with degree of polymerization (DP) 6-12 but fewer  
 modules with DP 15-24 (measured by high performance anion-exchange  
 chromatography on a Dionex Carbopac DA-100 column). The specification

includes a graph comparing DP distribution for modified and native **starch**.

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Process: All (I) are introduced simultaneously, particularly on a single nucleic acid construct, or one (I) is introduced first, selection made for presence of this (I), then one or more additional (I) introduced (e.g. by crossing plants each containing a single (I)). (I) are particularly linked, (in)directly, in the antisense orientation with respect to the promoter (which may be constitutive or tissue-specific). Particularly (I) are derived from the genes for **starch** synthases (SS) II and (III), especially from potato, or their equivalents.

Preferred plants: These are potato (most preferred), cassava, maize, wheat, barley, tomato, rice and pea.

Preparation: Transfer vectors are made by standard methods, e.g. isolating fragments from the appropriate genes and cloning them, usually in antisense orientation, into a plant transfer vector. The recombinant vector is then introduced into plant cells, and these regenerated to plants, by known methods.

ABEX UPTX: 20000301

EXAMPLE - Vector pPOT17 is the plant transfer vector pBIN19 containing in antisense orientation, a 1.2 kb BglII-BamHI fragment of cDNA for potato **starch** synthase (SS) II and a 1.14 kb fragment PstI-EcoRV fragment of cDNA for potato SS III. This plasmid was transferred, using *Agrobacterium tumefaciens* LBA4404, into potato tuber disks, and these regenerated to plants. The tubers that developed had significantly lower activities of SS II and III in the soluble fraction, but not in the granule-bound fraction. **Starch** granules were radially cracked and sunk in the center, and the **starch** had endosperm onset temperature 43-44degreesC compared with 60-61degreesC for the wild-type.

L78 ANSWER 9 OF 18 WPIX (C) 2003 THOMSON DERWENT  
 AN 1999-229220 [19] WPIX  
 DNC C1999-067421  
 TI New isolated potato isoamylase-type debranching enzyme gene.  
 DC C06 D16 D17  
 IN JOBLING, S A; SCHWALL, G P; WESTCOTT, R J  
 PA (NATT) NAT STARCH & CHEM INVESTMENT HOLDING COR  
 CYC 21  
 PI WO 9912950 A2 19990318 (199919)\* EN 50p C07H021-00  
 RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
 W: AU CA US  
 AU 9889911 A 19990329 (199932) C07H021-00  
 EP 1009751 A2 20000621 (200033) EN C07H021-00  
 R: AT BE DE DK ES FI FR GB GR IT NL PT SE  
 ADT WO 9912950 A2 WO 1998-GB2665 19980904; AU 9889911 A AU 1998-89911  
 19980904; EP 1009751 A2 EP 1998-941593 19980904, WO 1998-GB2665 19980904  
 FDT AU 9889911 A Based on WO 9912950; EP 1009751 A2 Based on WO 9912950  
 PRAI GB 1997-18863 19970906  
 IC ICM C07H021-00  
 AB WO 9912950 A UPAB: 19990518  
 NOVELTY - (A) A novel nucleic acid sequence is obtainable from potato plants and carries at least a portion of an isoamylase-type debranching enzyme (DBE) gene.  
 DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:  
 (1) a nucleic acid construct comprising a sequence as in (A) operably lined in the sense or antisense orientation to a promoter active in a plant;  
 (2) a host cell into which has been introduced a sequence as in (A), or a construct as in (1);  
 (3) a plant cell as in (2);  
 (4) a plantlet grown from a plant cell as in;  
 (5) a method of altering a plant by inhibiting the expression of an isoamylase comprising introducing into the plant at least 200bp of a

sequence carrying an isoamylase gene and exhibiting at least 80% identity with a nucleic acid sequence shown, the sequence being operably linked in the sense or antisense orientation to a suitable promoter active in the plant, and causing transcription of the introduced nucleic acid sequence, the transcript and/or the translation product being sufficient to interfere with the expression of a homologous isoamylase gene naturally present in the plant; and

(6) a plant altered by a method as in (5) or the progeny.

USE - The constructs can be used to alter the **starch** properties of plants such as potato, sweet potato, maize, wheat, barley, oat, cassava, pea or rice (claimed). The **starch** can have increased branching and/or shorter chain length, reduced peak viscosity, higher setback viscosity or increased viscosity onset temperature (claimed).

ADVANTAGE - By using an antisense sequence with greater homology to the native gene, greater inhibition can be achieved

Dwg.0/13

FS CPI

FA AB; DCN

MC CPI: C04-E02E; C04-E08; C04-F0800E; C04-P02; D05-H12D1; D05-H12E; D05-H14B3; D05-H16B; D06-H

TECH UPTX: 19990510

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Isolation: There are 2 regions within isoamylase proteins that are conserved. One of these is the same DGFRFD found in the pullulanase enzymes and the second (MDVVF/YNH) is found approximately 70 amino acids from this sequence towards the N-terminus. Degenerate oligonucleotide primers were made corresponding to these sequences (DBE2) and (DBE1) respectively, taking into consideration the codon usage in plant genes in order to reduce the degeneracy of the primers.

(1) TCA AAW CKR AAi CCA TC (DBE2); and

(2) ATG GAT GTT GTH TWY AAY CAT (DBE1).

These were used in a PCR reaction using first strand cDNA from potato leaf or tuber RNA or genomic DNA as template. The product was used to obtain a 1.5kb DNA sequence. The ORF contains 429 amino acids and is 77% identical to the maize isoamylase protein encoded by the sugary-1 gene. A PCR based cloning strategy was also used for isolating pullulanase type debranching enzymes from potato, using conserved domains within the known cloned gene sequences, of which spinach was the only plant gene (GenBank SOPULSP01). A product was obtained comprising 672 bp. Comparison of this sequence to the spinach gene showed it to be 75.7% identical at the DNA level and 75.5% at the protein level.

ABEX UPTX: 19990510

EXAMPLE - A plant transformation vector with the hygromycin selectable marker was constructed in which the 1.5kb isoamylase cDNA from plasmid pSJ132 was inserted in an antisense orientation under the control of the granule bound **starch** synthase (GBSS) promoter. This vector (pSJ138) was then used to transform wild type and waxy potato plants. The results showed that transformed potatoes were obtained which did not produce isoamylase activity.

L78 ANSWER 10 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1998-286958 [25] WPIX

DNN N1998-225473 DNC C1998-088989

TI **Starch** branching gene from cassava - useful for producing altered plants giving modified **starch**.

DC C06 D16 P13

IN **JOBLING, S A**; SAFFORD, R

PA (NATT) NAT STARCH & CHEM; (NATT) NAT STARCH & CHEM INVESTMENT HOLDING COR

CYC 23

PI WO 9820145 A2 19980514 (199825)\* EN 67p C12N015-82  
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
W: AU BR CA JP KR US



GB 2320716 A 19980701 (199828) C12N009-10  
 AU 9748747 A 19980529 (199841) C12N015-82  
 EP 941352 A2 19990915 (199942) EN C12N015-82  
 R: AT BE DE DK ES FI FR GR IT NL PT SE  
 AU 730900 B 20010315 (200121) C12N015-82  
 GB 2320716 B 20010620 (200136) C12N009-10  
 ADT WO 9820145 A2 WO 1997-GB3032 19971104; GB 2320716 A GB 1997-23142  
 19971104; AU 9748747 A AU 1997-48747 19971104; EP 941352 A2 EP 1997-911332  
 19971104, WO 1997-GB3032 19971104; AU 730900 B AU 1997-48747 19971104; GB  
 2320716 B GB 1997-23142 19971104  
 FDT AU 9748747 A Based on WO 9820145; EP 941352 A2 Based on WO 9820145; AU  
 730900 B Previous Publ. AU 9748747, Based on WO 9820145  
 PRAI GB 1996-23095 19961105  
 IC ICM C12N009-10; C12N015-82  
 ICS A01H005-00; C12N001-21; C12N015-54; C12N015-56; C12Q001-68  
 AB WO 9820145 A UPAB: 19980624

**Starch** branching gene from cassava comprises a nucleic acid sequence which encodes a polypeptide having **starch** branching enzyme (SBE) activity, where the encoded polypeptide comprises a portion of an amino acid sequence given the specification.

Also claimed are:

(1) a nucleic acid sequence comprising at least 200 bp and exhibiting at least 88% sequence identity with the corresponding region of the DNA sequence shown, operably linked in the sense or anti-sense orientation to a promoter operable in plants;

(2) a polypeptide having SBE activity encoded by the above gene which comprises an amino acid sequence as shown in the specification;

(3) plants, their progeny or plant cells into which has been artificially introduced the nucleic acid of ;

**starch** obtainable from an altered plant as in , having altered properties compared to **starch** extracted from an equivalent but unaltered plant.

USE - The products can be used for producing plants having altered **starch** quantities and qualities. They can also be used for producing altered plants such as cassava, banana, potato, pea, tomato, maize, wheat, barley, oat, sweet potato and rice plants.

Dwg.0/0

FS CPI GMPI

FA AB; DCN

MC CPI: C04-A08; **C04-C02B**; C04-E02; C04-E02F; C04-F08; C04-N01;  
 C04-N03; D05-H12B2; D05-H12D2; D05-H16B

L78 ANSWER 11 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1996-506170 [50] WPIX

DNN N1996-426462 DNC C1996-158850

TI New potato plant **starch** having high amylose content - also class  
 A **starch** branching enzyme and corresp. DNA to alter the  
 viscosity of **starch**; for use in food, biodegradable products,  
 adhesives, etc..

DC C06 D16 D17 F06 G02 G03 P13

IN COOKE, D; DEBET, M; GIDLEY, M J; **JOBLING, S A**; SAFFORD, R;  
 SIDEBOTTOM, C M; **WESTCOTT, R J**

PA (NATT) NAT STARCH & CHEM INVESTMENT HOLDING COR

CYC 23

PI WO 9634968 A2 19961107 (199650)\* EN 142p C12N015-82  
 RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
 W: AU BR CA JP KR US

AU 9655099 A 19961121 (199711) C12N015-82

WO 9634968 A3 19961205 (199712) C12N015-82

EP 826061 A2 19980304 (199813) EN C12N015-82

R: AT BE DE DK ES FI FR GB GR IT NL PT SE

AU 706009 B 19990603 (199933) C12N015-82

ADT WO 9634968 A2 WO 1996-GB1075 19960503; AU 9655099 A AU 1996-55099

19960503; WO 9634968 A3 WO 1996-GB1075 19960503; EP 826061 A2 EP 1996-912161 19960503, WO 1996-GB1075 19960503; AU 706009 B AU 1996-55099 19960503

FDT AU 9655099 A Based on WO 9634968; EP 826061 A2 Based on WO 9634968; AU 706009 B Previous Publ. AU 9655099, Based on WO 9634968

PRAI GB 1996-7409 19960410; GB 1995-9229 19950505

REP 8.Jnl.Ref; JP 06261767; WO 9012084; WO 9211375; WO 9214827; WO 9424292; WO 9507355; WO 9526407; WO 9619581

IC ICM C12N015-82  
ICS A01H005-00; **C08B030-04**; C12N015-54

AB WO 9634968 A UPAB: 19961219  
A new **starch** extracted from a potato plant has an amylose content of 35%, as determined by the idiometric assay method of Morrison and Laignelet (1983. J. Cereal Science 1, 9-20).  
USE - The **starch** is used in the prepn. or processing of a foodstuff, such as in providing films, barriers, coatings or as gelling agents. The resistant **starch** compsns. are used in the prepn. or processing of corrugating adhesives, biodegradable prods., packaging, glass fibres or textiles (claimed). The characteristics (e.g. **starch** compsn.) of a plant are altered by introducing the NS linked to a promoter. The SBE is used to modify **starch** in vitro.  
Dwg.0/13

FS CPI GMPI

FA AB

MC CPI: **C04-C02B2**; D05-H12A; D05-H12E; D05-H14; D05-H16B; D05-H17A3; **D06-H01**; F01-H06; G02-A02A; G03-B02A

L78 ANSWER 12 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1995-351326 [45] WPIX

DNN N1995-261962 DNC C1995-153906

TI New transformed potato plants or their progeny - contg. anti sense **starch** branching enzyme cDNA used for producing **starch** with altered properties.

DC C06 D16 D17 F06 F09 G03 P13

IN COOKE, D; GIDLEY, M J; **JOBLING, S A**; SAFFORD, R; SIDEBOTTOM, C M; **WESTCOTT, R J**

PA (NATT) NAT STARCH & CHEM INVESTMENT; (NATT) NAT STARCH & CHEM INVESTMENT HOLDING COR

CYC 58

PI WO 9526407 A1 19951005 (199545)\* EN 36p C12N015-82  
RW: AT BE CH DE DK ES FR GB GR IE IT KE LU MC MW NL OA PT SD SE SZ UG  
W: AM AT AU BB BG BR BY CA CH CN CZ DE DK ES FI GB GE HU JP KE KG KP  
KR KZ LK LT LU LV MDMG MN MW NL NO NZ PL PT RO RU SD SE SI SK TJ  
TT UA US UZ VN  
AU 9519028 A 19951017 (199604) C12N015-82  
EP 754235 A1 19970122 (199709) EN C12N015-82  
R: AT BE DE ES FR GB IT NL SE  
AU 688006 B 19980305 (199820) C12N015-82  
US 6103893 A 20000815 (200041) **C08B030-00** <--  
CA 2186399 C 20010904 (200155) EN C12N015-54

ADT WO 9526407 A1 WO 1995-GB634 19950322; AU 9519028 A AU 1995-19028 19950322; EP 754235 A1 EP 1995-911460 19950322, WO 1995-GB634 19950322; AU 688006 B AU 1995-19028 19950322; US 6103893 A WO 1995-GB634 19950322, US 1996-716449 19960924; CA 2186399 C CA 1995-2186399 19950322, WO 1995-GB634 19950322

FDT AU 9519028 A Based on WO 9526407; EP 754235 A1 Based on WO 9526407; AU 688006 B Previous Publ. AU 9519028, Based on WO 9526407; US 6103893 A Based on WO 9526407; CA 2186399 C Based on WO 9526407

PRAI EP 1995-300210 19950113; GB 1994-6022 19940325; EP 1994-305806 19940804

REP 05Jnl.Ref; DE 4104782; WO 9211375; WO 9214827

IC ICM **C08B030-00**; C12N015-54; C12N015-82

ICS A01H005-00; C08B030-04; C08B030-14;  
C08B030-20; C12N015-11

AB WO 9526407 A UPAB: 19951114

Transformed potato plants or their progeny capable of giving rise to tubers having altered **starch**, comprising at least an effective portion of a **starch** branching enzyme (SBE) cDNA operably linked in the antisense orientation to a suitable promoter, such that the level of SBE is limited to less than 0.8 units per gram of tuber, are claimed. Also claimed are: (1) a vector for modifying a potato plant so as to cause the plant to be capable of giving rise to tubers having less than 0.8 units of SBE activity per gram of tuber, the vector comprising at least an effective portion of a SBE cDNA operably linked in the antisense orientation to a suitable promoter; (2) altered **starch** extracted from transformed potato plants or their progeny, the plants having less than 0.8 units SBE activity per gram of tuber, where the extracted **starch** has the following physical properties: (i) an elevated peak temp. of gelatinisation (detd. by differential scanning calorimetry (DSC)), relative to unaltered **starch** extracted from equivalent non-transformed plants; and (ii) an elevated viscosity onset temp., relative to unaltered **starch** extracted from equivalent non-transformed plants.

USE - The **starches** can be used in food and non-food (e.g. paper, textiles and adhesives) applications.

ADVANTAGE - The plants have low levels of SBE activity, and produce **starches** with elevated peak temps. of gelatinisation and viscosity onset.

Dwg.0/8

FS CPI GMPI

FA AB; DCN

MC CPI: C04-A08C2E; C04-E08; D05-H12D2; D05-H12E; D05-H16B; D06-H01  
; F01-H06; F05-A06B; F05-A06C; G03-B02A

L78 ANSWER 13 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1991-267128 [36] WPIX

DNC C1991-115836

TI High density liq. yeast compsns. - comprising fresh yeast and poly hydroxy cpd. with improved **freeze-thaw** properties etc..

DC A97 D16 E13 E17

IN SUORANTA, K

PA (ALKO-N) ALKO LTD; (ALKO-N) ALKO GROUP LTD; (LALL-N) LALLEMAND INC;  
(ALKO-N) ALKO LTD FINNISH STATE ALCOHOL CO

CYC 40

PI WO 9112315 A 19910822 (199136)\*

RW: AT BE CH DE DK ES FR GB GR IT LU NL OA SE

W: AT AU BB BG BR CA CH DE DK ES FI GB HU JP KP KR LK LU MC MG MW NL

NO PL RO SD SE SU US

AU 9172288 A 19910903 (199148)

CS 9100402 A 19910915 (199148)

PT 96762 A 19911031 (199148)

ZA 9100336 A 19920226 (199213)

CN 1054098 A 19910828 (199222) C12N001-16 <--

FI 9203665 A 19920814 (199245) C12N000-00 <--

EP 515406 A1 19921202 (199249) EN 30p C12N001-18 <--

R: AT BE CH DE DK ES FR GB GR IT LI LU NL SE

NZ 237119 A 19930727 (199333) C12N001-04 <--

AU 643505 B 19931118 (199402) C12N001-18 <--

US 5427943 A 19950627 (199531) 12p C12N001-16 <--

EP 515406 B1 19951227 (199605) EN 18p C12N001-18 <--

R: AT BE CH DE DK ES FR GB GR IT LI LU NL SE

DE 69115889 E 19960208 (199611) C12N001-18 <--

FI 102188 B1 19981030 (199849) C12N001-18 <--

CA 2074267 C 20020205 (200213) EN C12N001-16 <--

ADT ZA 9100336 A ZA 1991-336 19910116; CN 1054098 A CN 1991-100905 19910213;

FI 9203665 A WO 1991-FI47 19910215, FI 1992-3665 19920814; EP 515406 A1 EP 1991-903204 19910215, WO 1991-FI47 19910215; NZ 237119 A NZ 1991-237119 19910214; AU 643505 B AU 1991-72288 19910215; US 5427943 A Cont of US 1991-655816 19910215, US 1993-86467 19930706; EP 515406 B1 EP 1991-903204 19910215, WO 1991-FI47 19910215; DE 69115889 E DE 1991-615889 19910215, EP 1991-903204 19910215, WO 1991-FI47 19910215; FI 102188 B1 WO 1991-FI47 19910215, FI 1992-3665 19920814; CA 2074267 C CA 1991-2074267 19910215, WO 1991-FI47 19910215

FDT EP 515406 A1 Based on WO 9112315; AU 643505 B Previous Publ. AU 9172288, Based on WO 9112315; EP 515406 B1 Based on WO 9112315; DE 69115889 E Based on EP 515406, Based on WO 9112315; FI 102188 B1 Previous Publ. FI 9203665; CA 2074267 C Based on WO 9112315

PRAI FI 1990-804 19900216

REP DE 3625170; EP 259739; US 28276; US 3960664; US 4226940; US 4719114

IC ICM C12N001-04; C12N001-16; C12N001-18

ICS A21D008-04

AB WO 9112315 A UPAB: 19951019

High-density yeast compsn. comprises (by wt) 1-20% of a polyhydroxy-cpd. (I) and 80-99% of fresh yeast (II) and has density more than 800g yeast (227-29%) dry matter)/1 of prepn. with (I) concn. in the extracellular liq. 5-50% w/v. (I) is propylene glycol, glycerol, non-fermentable mono- or oligosaccharides (e.g. xylose) or sugar alcohols (e.g. mannitol or sorbitol), soluble oligo- or polymeric carbohydrates (e.g. partially hydrolysed **starch**, cellulose or agarose) and polyethylene glycol or mixts.

USE/ADVANTAGE - The compsn. has improved ability to retain its activity, dissolves instantly, and is easily batched, is uniformly suspendable and is tolerant of repeated **freezing** and **thawing**. The compsn. is useful in the prepn. of improved quality baker's brewer's distiller's and wine yeast. @ (30pp Dwg.No.0/5) 0/5

FS CPI

FA AB; DCN

MC CPI: A12-W11L; D05-B; D05-B04; E07-A02A; E10-A07; E10-E04H

ABEQ US 5427943 A UPAB: 19950810

High density yeast prepn. comprises (a) 1-20 wt.% glycerol, and (b) 80-99 wt.% fresh compressed yeast each w.r.t. total.

Prepn. has density more than 800 g. of yeast per l. of prepn. Yeast has dry matter content of 27-29%. Concn. of glycerol is extracellular liq. of the fresh yeast is 5-50% w/v.

USE - Used as brewer's yeast, sourdough yeast, wine yeast, baker's yeast or distiller's yeast, which can retain its activity, dissolve instantly, be easily batched, is uniformly suspendable and tolerable to repeated **freezing** and **thawing** (claimed). Dwg.0/5

ABEQ EP 515406 B UPAB: 19960205

A high-density liquid or pasty yeast preparation having a capability of retaining its activity, dissolving instantly and being easily batched, uniformly suspendable and tolerant of repeated **freezing** and **thawing**, and comprising 1-20% (w/w) of a polyhydroxy compound selected from a group comprising propylene glycol, glycerol, nonfermentable mono- or oligosaccharides such as xylose, or non-fermentable sugar alcohols such as mannitol and sorbitol, soluble oligo- or polymeric carbohydrates such as partially hydrolysed **starch**, cellulose or agarose or derivatives thereof and polyethylene glycol, or mixtures thereof, and 80-99% (w/w) of fresh yeast, said high-density yeast preparation having a density of more than 800 g yeast (27-29% dry matter) per 1 liter of the yeast preparation, the concentration of the polyhydroxy compound in the extracellular liquid being 5-50% (w/w).

Dwg.0/5

AN 1989-265272 [37] WPIX  
DNC C1989-117614  
TI Non-retro grading **starch** derivs. - obtd. by degradation, pref.  
with beta-amylase, and are useful as gum arabic replacements.  
DC A11 A97 D13 D16 D17 F06 G02  
IN CHIU, C; CHUNGWAI, C; CHUNG-WAI, C  
PA (NATT) NAT STARCH & CHEM CORP; (NATT) NAT STARCH & CHEM INVESTMENT  
CYC 26  
PI EP 332027 A 19890913 (198937)\* EN 18p  
R: AT BE CH DE ES FR GB IT LI  
DK 8901165 A 19890912 (198946)  
NO 8901039 A 19891009 (198946)  
FI 8901091 A 19890912 (198949)  
PT 89979 A 19891110 (198950)  
AU 8934762 A 19900222 (199014)  
JP 02055702 A 19900226 (199014)  
ZA 8903377 A 19900627 (199030)  
CN 1040374 A 19900314 (199050)  
US 4977252 A 19901211 (199101)  
US 5185176 A 19930209 (199308) 9p A23L001-222  
IL 90061 A 19930922 (199349) C08B030-12 <--  
KR 9210521 B1 19921204 (199414) C08B031-00  
NO 175262 B 19940613 (199427) C08B031-00  
CA 1333894 C 19950110 (199511) C12P019-22  
PH 27035 A 19930201 (199635) C08B031-04  
JP 2540204 B2 19961002 (199644) 10p C08B031-04  
EP 332027 B1 20010207 (200109) EN C08B030-12 <--  
R: AT BE CH DE ES FR GB GR IT LI LU NL SE  
DE 68929281 E 20010315 (200122) C08B030-12 <--  
ES 2155432 T3 20010516 (200138) C08B030-12 <--  
ADT EP 332027 A EP 1989-103504 19890228; JP 02055702 A JP 1989-93314 19890414;  
US 4977252 A US 1988-234070 19880818; US 5185176 A CIP of US 1988-167051  
19880311, Div ex US 1988-234070 19880818, US 1990-522005 19900510; IL  
90061 A IL 1989-90061 19890424; KR 9210521 B1 KR 1989-6094 19890508; NO  
175262 B NO 1989-1039 19890310; CA 1333894 C CA 1989-592893 19890306; PH  
27035 A PH 1989-38285 19890306; JP 2540204 B2 JP 1989-93314 19890414; EP  
332027 B1 EP 1989-103504 19890228; DE 68929281 E DE 1989-629281 19890228,  
EP 1989-103504 19890228; ES 2155432 T3 EP 1989-103504 19890228  
FDT US 5185176 A Div ex US 4977252; NO 175262 B Previous Publ. NO 8901039; JP  
2540204 B2 Previous Publ. JP 02055702; DE 68929281 E Based on EP 332027;  
ES 2155432 T3 Based on EP 332027  
PRAI US 1988-167051 19880311; US 1988-234070 19880818  
REP FR 1570132; GB 1160356; US 4035235  
IC ICM A23L001-222; C08B030-12; C08B031-00; C08B031-04; C12P019-22  
ICS A23L001-035; A23L001-05; A23L001-052; A23L001-19; A23L001-195;  
B01F017-48; C08B031-16; C08B033-02; C08B037-18; C08L003-02;  
C12N009-26; C12P019-20  
AB EP 332027 A UPAB: 19930923  
A modified **starch** is claimed whose emulsions are characterised  
by improved stability and resistance to oiling and gelling during storage.  
The **starch** is a deriv. contg. a hydrophobic gp. (or  
hydropticlic and hydrophobic gps) of which up to 70 wt.% has been degraded  
by an excoenzyme capable of cleaving 1,4-alpha-D-glucosidic linkages from  
non-reducing 1,6-alpha-glucosidic linkages. Claimed prepn. is by degrading  
the gelatinised **starch** deriv. to maltose, pref. using  
beta-amylase. Derivatisation to give the hydrophobic (and opt. also  
hydrophilic) gps. may be before or after the degradation.  
USE/ADVANTAGE - Emulsions for industrial application (specifically  
food prod. or beverage emulsions) contg. the modified **starch**  
deriv. are claimed. The deriv. is useful as a replacement for gum arabic,  
showing stability during shelf-storage, refrigeration and **freeze**  
/**thaw** cycles. It is esp. useful in beverages flavoured with eg.  
citrus oils, being resistant to retrogradation.

0/0  
 FS CPI  
 FA AB  
 MC CPI: A03-A; A10-E05; A12-W09; D03-H01J; D05-C08; F01-H06A; F05-A06B;  
 G03-B02A  
 ABEQ US 4977252 A UPAB: 19930923  
 Modified **starch** having emulsification properties whose emulsions have improved stability and resistance to oiling and gelling during storage, comprising a **starch** deriv. contg. a hydrophobic gp. or both a hydrophilic gp. and a hydrophobic gp. of which up to 70 wt.% has been degraded by an exo-enzyme capable of cleaving 1,4-alpha-D-glucosidic linkages from non-reducing ends of the **starch** but incapable of cleaving 1,6-alpha-D-glucosidic linkages of the **starch**.  
 The **starch** is acid or heat-converted, or converted by alpha-amylase to a WF of up to about 60. The exo-enzyme is beta-amylase. The **starch** is a waxy maize **starch**. The **starch** is pref. gelatinised and has been derivatised by treatment with at least 0.25% octenylsuccinic acid anhydride on a **starch** dry wt. basis. The **starch** is further derivatised to contain hydroxy-propyl gps.  
 USE/ADVANTAGE - The modified **starch** is used particularly in foods and beverages contg. flavour oil emulsions. Emulsifying agents are used in food, cosmetics, paint, pharmaceutical, polymer industries, etc. The **starch** emulsifier has improved shelf stability.  
 ABEQ US 5185176 A UPAB: 19930923  
 Food prod. comprises an emulsion which is prepd. using a **starch** deriv. contg. a hydrophobic gp. (and opt. a hydrophilic gp.) of which 70 wt.% or less has been degraded to maltose by reacting with an exoenzyme which can cleave 1,4-alpha-D-glucosidic linkages from non-reducing ends of **starch** but not 1,6-alpha-D-glucosidic linkages of **starch** itself.  
 Beverage flavour concentrate comprises the emulsion, flavouring oil(s), sweetener(s) and water.  
 ADVANTAGE - Has improved stability and resistance to oiling and gelling during storage.  
 0/0  
 L78 ANSWER 15 OF 18 WPIX (C) 2003 THOMSON DERWENT  
 AN 1987-001902 [01] WPIX  
 DNN N1987-001421 DNC C1987-000778  
 TI Beta-1,3-glucan polysaccharide gel with uniform structure and pH - prepd. by critical temp. neutralisation, useful e.g. as coating for pharmaceuticals and carrier for biological materials.  
 DC A11 A96 B04 D13 D16 D21 D22 P81  
 IN PROVONCHE, R B; RENN, D W  
 PA (FMCC) FMC CORP  
 CYC 5  
 PI GB 2176795 A 19870107 (198701)\*  
 DE 3621303 A 19870108 (198702)  
 SE 8602805 A 19861226 (198707)  
 JP 62030102 A 19870209 (198711)  
 US 4774093 A 19880927 (198841) 7p  
 GB 2176795 B 19890906 (198936)  
 ADT GB 2176795 A GB 1986-615339 19860624; DE 3621303 A DE 1986-3621303 19860625; JP 62030102 A JP 1986-147253 19860625; US 4774093 A US 1985-748526 19850625; GB 2176795 B GB 1986-15339 19860624  
 PRAI US 1985-748521 19850625  
 IC A61K007-16; A61K047-00; B01J013-00; C08B037-00; C08L003-02; C12N001-20; C12N009-24; C12N011-10; C12N015-00; C12P019-04; C12R001-05; G02B001-04; G02C007-04  
 AB GB 2176795 A UPAB: 19930922  
 A new beta-1,3-glucan polysaccharide (I) gel has a coherent, uniform, non-particulate structure and substantially uniform pH throughout. Particularly (I) is produced by a microorganism of the genera *Alcaligenes*

(esp. *A. faecalis*) or *Agrobacterium*.

(I), normally insoluble in neutral aq. medium, is dissolved at 0.5-5 wt.% in aq. alkaline medium at 55 deg.C or lower, then the soln. adjusted to pH 10.5 or lower, at at least 50 deg.C when this soln. is cooled to below 40 deg.C it reversibly forms a high-strength gel. When heated above 50 deg.C, the soln. forms a gel irreversibly.

USE/ADVANTAGE - This gel is useful as a carrier for biological products and pharmaceuticals; as a coating for biological materials and for making disposable contact lens. Typical applications include support/sepn. media for electrophoresis, cell culture, affinity chromatography, etc.; in foods; medicinal films; slow-release pharmaceutical coatings; in heat-resistant toothpastes, etc.. Because of its uniformity, this gel provides improved sepn. of biological cpds. and can be used for pH-sensitive material. The gels have excellent stability towards autoclaving and **freeze-thaw** cycling.

0/0

FS CPI GMPI

FA AB

MC CPI: A03-A; A12-S; B04-C02F; B12-L04; B12-M02A; B12-M03; B12-M10A; D03-H; D09-C01A

ABEQ GB 2176795 B UPAB: 19930922

A method of preparing an aqueous polysaccharide solution capable upon cooling below 40 deg.C, of forming a reversible, high strength gel and capable upon being heated above 50 deg.C of forming a thermally irreversible, high strength gel, the gel having a coherent, uniform, non-particulate structure and a substantially uniform pH throughout, which comprises: dissolving a beta-1,3-glucan polysaccharide, normally insoluble in neutral aqueous medium, but soluble in alkaline aqueous medium, in an aqueous alkaline medium at a temperature of 55 deg.C or below to provide a solution thereof; and while maintaining the solution at a temperature of at least 50 deg.C but lower than the decomposition temperature of the polysaccharide, adjusting the pH of the solution to 10.5 or lower.

ABEQ US 4774093 A UPAB: 19930922

Novel beta-1,3-glucan polysaccharide gel has (a) coherent uniform non-particulate structure, with (b) a uniform pH throughout. Prodn. is biological from the microorganism *Alcaligenes faecalis* var. *myxogenes*. Aq. polysaccharide soln. which can cool below 40 deg. C to form a reversible high strength gel, and also form a thermally irreversible high strength gel upon heating above 50 deg. C, is prepd. from the polysaccharide which is insoluble in neutral aq. medium but soluble in alkaline aq. medium, by (i) dissolving in aq. alkaline medium at 55 deg. C or less to form soln.; and (ii) maintaining soln. at 50 deg. C to less than its decomposition temp., and adjusting to pH10.5 or less.

USE - In prodn. of a disposable contact lens.

L78 ANSWER 16 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1980-69839C [40] WPIX

TI Colloidal antifreeze agent of hydroxyethyl **starches** - allows quicker and more intense **freezing** and preservation of blood cells without affecting biological activity.

DC A11 A96 D22

IN BEEZ, M; DIRKS, E; KRICK, G

PA (FREP) FRESSENIUS CHEM PHARM IND EDUARD; (FREP) FRESSENIUS E CHEM-PHARM

CYC 3

PI DE 2908436 A 19800925 (198040)\*

GB 2046772 A 19801119 (198047)

FR 2450632 A 19801107 (198051)

GB 2046772 B 19830525 (198321)

PRAI DE 1979-2908436 19790305

IC A01N001-02; A61K035-14; B01J013-00; C08L003-08; C12N005-02

AB DE 2908436 A UPAB: 19930902

A colloidal antifreeze agent consisting of hydroxy ethyl **starches**

(HES) is new. The HES pref. comprises at least 90% of amylopectin hydrolysate and pref. has a specific viscosity of 0.05-0.30 dl/g at 25 degrees C, an ether substn. degree of up to 0-90 hydroxyethyl gps. per **starch** molecule and mixt. 30,000-700,000. The ethylene glycol part of the HES is pref. <0.5 pts. wt. ethylene glycol per 100 pts. modified **starch**. Pref. the HES is mixed with polyvinylpyrrolidone and glycerine, and 1-50% HES solns. are used.

The antifreeze agent can be used in the (cryoconservation) **freeze** preservation of erythrocytes, thrombocytes, leucocytes, bone marrow cells and cells from other organs, without affecting their biological activity. The **freezing** and **thawing** processes are simplified and there is no need to wash the **thawed** cells. The antifreeze agent allows the prepn. of special **freezing** concentrates with exceptional **freezing** rate and **freezing** intensity, but which do not cause great cell losses.

FS CPI

FA AB

MC CPI: A10-E08C; A12-V; D05-H

L78 ANSWER 17 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1979-36018B [19] WPIX

TI Glutinous rice cracker prodn. - by **freezing starch** material, **thawing** it and mixing it with rice.

DC D11

PA (KOMI-I) KOMIYA Y

CYC 1

PI JP 54041362 A 19790402 (197919)\*

PRAI JP 1977-105696 19770901

IC A23G003-00

AB JP 54041362 A UPAB: 19930901

The method comprises (1) **freezing** the **starch**-material paste, such as sweet **potato starch** or sake less, for 1 night, (2) **thawing** it and (3) mixing it with rice.

A cracker having food texture can be produced using large amts. of **starch** material. By **freezing** and **thawing** the **starch** material, amylopectin and amylose are sepd. and the texture of the cracker can be improved.

FS CPI

FA AB

MC CPI: D03-H01

L78 ANSWER 18 OF 18 WPIX (C) 2003 THOMSON DERWENT

AN 1974-43730V [24] WPIX

TI **Starch** extn. from water-contg. raw materials - eg slurries of **tubers**, roots and unripe fruit, by introducing **freezing-thawing** step to increase yields.

DC D17

PA (SEID-I) SEIDEMANN J

CYC 1

PI DD 104811 A 19740320 (197424)\*

PRAI DD 1973-171424 19730608

IC C13L001-00

AB DD 104811 A UPAB: 19930831

Introduction of a **freeze-thaw** step after washing, peeling and comminution, increases **starch** yields. Sepd. pulp is almost free from **starch** attached to fibres or protein. Parameters should be chosen so as to form larger ice crystals followed by destruction of tissue cells after **thawing** so that **starch** can be washed well out of pulp. Process is used for aq. slurries of **potatoes**, sweet **potatoes**, manioc, yams, unripe apples etc., and can be applied to dried raw materials, e.g. **potato** and manioc flour, by slurring with water in up to 1:30 ratio.

FS CPI



FA AB  
MC CPI: D06-H

=> d his

(FILE 'HOME' ENTERED AT 10:26:49 ON 25 APR 2003)  
SET COST OFF

FILE 'REGISTRY' ENTERED AT 10:27:54 ON 25 APR 2003

L1 1 S STARCH/CN  
L2 1 S AMYLOSE/CN  
L3 2903 S STARCH  
L4 2902 S L3 NOT L1,L2  
L5 2286 S L4 NOT SQL/FA  
L6 983 S L5 NOT (COMPD OR WITH OR (MXS OR MNS OR IDS)/CI)

FILE 'HCAPLUS' ENTERED AT 10:29:11 ON 25 APR 2003

L7 56936 S L1  
L8 117387 S L6  
L9 135249 S STARCH?  
L10 137106 S ?STARCH?  
L11 239981 S L7-L10  
L12 14072 S L11 AND POTATO?  
E POTATO/CT  
L13 14247 S E3  
L14 5549 S E28  
E E28+ALL  
L15 24454 S E16,E17,E15+NT  
L16 3327 S L11 AND L13-L15  
L17 14072 S L12,L16  
L18 6021 S L1 (L) PRP/RL  
L19 187 S L1 (L) PUR/RL  
L20 1313 S L1 (L) (BMF OR BPN OR IMF OR PNU OR SPN)/RL  
L21 2945 S L1 (L) PREP/RL  
L22 1508 S L17 AND L18-L21  
L23 989 S L22 AND L18  
L24 51 S L23 AND (FREEZ? OR FROZ?)  
L25 15 S L23 AND THAW?  
L26 473 S L23 AND (TEMPERATURE OR HEAT? OR COLD? OR COOL? OR THERMAL?)  
L27 31 S L26 AND L24  
L28 15 S L25 AND L24,L26

FILE 'REGISTRY' ENTERED AT 10:38:13 ON 25 APR 2003

L29 1 S GLUCAN/CN

FILE 'HCAPLUS' ENTERED AT 10:38:17 ON 25 APR 2003

L30 292 S (L2 OR L29 OR AMYLOSE OR GLUCAN) AND L23  
L31 15 S L30 AND L24  
L32 5 S L30 AND L25  
L33 165 S L30 AND L26  
L34 25 S L28,L31,L32  
E WESTCOTT R/AU  
L35 18 S E5,E10,E11  
E JOBLING S/AU  
L36 28 S E3-E6  
E SCHWALL G/AU  
L37 10 S E3-E6  
E WO2000-GB3522/AP, PRN  
L38 1 S E3,E4  
E GB99-21830/AP, PRN  
L39 1 S E4  
L40 13 S L35-L39 AND L11

L41 12 S L40 AND L17  
 L42 1 S L40 NOT L41  
 L43 35 S L34,L38,L39,L41  
 L44 23 S L43 AND (PD<=20000913 OR PRD<=20000913 OR AD<=20000913)  
 SEL DN AN 3 18 23  
 L45 20 S L44 NOT E1-E9  
 L46 22 S L41,L45  
 L47 22 S L46 AND L7-L28,L30-L46  
 L48 22 S L47 AND (AMYLO? OR GLUCAN OR ?STARCH? OR FREEZ? OR FROZ? OR T  
 L49 22 S L48 AND L7,L8,L29,L3  
 SEL HIT RN

FILE 'REGISTRY' ENTERED AT 11:00:11 ON 25 APR 2003

L50 8 S E10-E17

FILE 'HCAPLUS' ENTERED AT 11:00:52 ON 25 APR 2003

FILE 'REGISTRY' ENTERED AT 11:01:05 ON 25 APR 2003

FILE 'WPIX' ENTERED AT 11:01:17 ON 25 APR 2003

E WO2000-GB3522/AP, PRN  
 L51 1 S E3  
 E GB99-21830/AP, PRN  
 L52 1 S E4  
 L53 1 S L51,L52  
 L54 941 S C08B030/IC, ICM, ICS  
 L55 2601 S C08L003/IC, ICM, ICS  
 L56 1076 S D06-H01/MC  
 L57 3143 S (B04-C02B OR C04-C02B OR B04-C02B2 OR C04-C02B2)/MC  
 L58 4518 S 1863/DRN OR R01863/DCN  
 L59 42758 S ?STARCH?/BIX  
 L60 45402 S L54-L59  
 L61 1863 S L60 AND (FREEZ? OR FROZ?)/BIX  
 L62 356 S L61 AND (THAW? OR DEFROST? OR DE FROST?)/BIX  
 L63 44 S L62 AND (?POTATO? OR ?TUBER? OR SOLAN?)/BIX  
 L64 2742 S L60 AND C12N/IC, ICM, ICS  
 L65 458 S L60 AND (D05-H14B3 OR D05-H16B)/MC  
 L66 20 S L64,L65 AND L62  
 L67 3 S L63 AND L66  
 SEL DN AN 3 5 7 8 9 17 18 19 20 L66  
 L68 9 S L66 AND E1-E20  
 SEL DN AN L67 1 2  
 L69 2 S E21-E24  
 L70 9 S L68,L69,L53 AND L51-L69  
 L71 41 S L63 NOT L66  
 SEL DN AN L71 AB 6 8 38 41  
 DEL SEL  
 SEL DN AN L71 6 8 38 41  
 L72 4 S E1-E6  
 L73 13 S L70,L72 AND L51-L72  
 E JOBLING S/AU  
 L74 8 S E4  
 E SCHWALL G/AU  
 L75 3 S E4  
 E WESTCOTT R/AU  
 L76 8 S E3,E6  
 L77 6 S L74-L76 AND L60  
 L78 18 S L73,L77  
 L79 5 S L74-L76 NOT L78

FILE 'WPIX' ENTERED AT 11:20:50 ON 25 APR 2003